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TWENTY-EIGHTH ANNUAL REPORT

OF THE

HEALTH DEPARTMENT

OF THE

CITY OF BOSTON

FOR THE YEAR 1899

BOSTON
MUNICIPAL PRINTING OFFICE
1900

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SAMUEL H. DURGIN, *Chairman.*
GEORGE F. BABBITT.
EDWIN L. PILSBURY.

CHARLES E. DAVIS, Jr., *Secretary.*

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HEALTH DEPARTMENT, OLD COURT HOUSE,
BOSTON, February 1, 1900.

HON. THOMAS N. HART,
Mayor of the City of Boston:

SIR, — The Board of Health respectfully submits its twenty-eighth annual report, covering the work of the Health Department for the past year, together with a statement of the receipts and expenditures of the department from February 1, 1899, to February 1, 1900.

The total number of deaths for the year was 11,167, an increase over the previous year of 281 deaths. The population, as estimated at the end of the year, is 555,057, which is based on the geometrical rate of increase between the last two census years, 1885–1895. The death-rate for the year, as calculated on this population, is 20.12 per 1,000 inhabitants. This rate is more by .03 than that of the previous year, and with one exception the lowest on record. There were 1,444 deaths from zymotic diseases, a decrease of 26 deaths from the same group of the previous year. There were 107 more deaths from diphtheria than in 1898, with a proportionate increase in the number of cases. The percentage of deaths to the number of cases of diphtheria reported was 9.77 as against 10.23 per cent. the preceding year. There were 74 deaths from scarlatina, 41 more deaths than in the preceding year, and 45 less than the average of the five previous years. Typhoid fever caused 165 deaths during the year, 20 less deaths than the preceding year. Seventy-six of the deaths from this cause occurred during the months of August, September, and October, and 119 of the whole number died between the ages of 20 and 40 years. There were 33 deaths from measles during the year. The number of deaths of children under five years of age was 3,591 compared with 3,577 for the previous year, showing an increase of 14 deaths. The respiratory diseases are still the most fatal, causing fully 27 per cent. of the whole mortality the past year, as against 25 per cent. in 1898.

COMPARATIVE DEATHS IN AMERICAN AND FOREIGN CITIES.

The following tables have been prepared to show the comparison of deaths in a few large American and foreign cities, as compared with the city of Boston. It is to be regretted that the amount of information desired is not fully complete, owing to the scarcity of material and information furnished, but in their present condition, as a matter of reference, they may be of value:

Boston.

YEARS.	Population.	Total Deaths.	Population of Children under 5 years of age.[1]	Deaths of children under 5 years of age.	Deaths from Diphtheria.	Deaths from Scarlatina.	Deaths from Typhoid Fever.	Deaths from Measles.
1880	362,839	8,531	29,649	3,349	588	33	154	49
1881	368,190	9,016	30,809	3,314	601	35	207	108
1882	373,620	8,995	31,969	3,151	458	75	212	25
1883	379,129	9,740	33,129	3,627	445	211	198	152
1884	384,720	9,622	34,289	3,570	345	209	216	13
1885	390,393	9,618	35,449	3,466	334	156	152	84
1886	401,374	9,268	36,582	3,186	329	81	135	36
1887	412,663	10,073	37,717	3,662	316	195	183	119
1888	424,274	10,197	38,849	3,509	470	65	170	27
1889	436,208	10,259	39,983	3,633	564	23	186	48
1890	448,477	10,181	41,117	3,349	401	42	155	19
1891	457,772	10,571	42,251	3,608	232	64	154	21
1892	467,260	11,236	43,383	3,735	414	262	137	19
1893	476,945	11,710	44,518	3,987	476	248	148	27
1894	486,830	11,520	45,654	4,108	817	192	141	8
1895	501,083	11,329	46,787	3,935	588	114	163	19
1896	516,305	11,634	47,920	4,055	516	121	162	27
1897	528,912	11,154	49,053	3,708	411	136	173	21
1898	541,827	10,886	50,185	3,577	170	33	185	27
1899	555,057	11,167	51,317	3,591	277	74	165	33

[1] Corrected by census years.

Philadelphia, Pa.

YEARS.	Population.	Total Deaths.	Population of Children under 5 years of age.	Deaths of Children under 5 yrs. of age.	Deaths from Diphtheria.	Deaths from Scarlatina.	Deaths from Typhoid Fever.	Deaths from Measles.
1880[1]	846,980	17,711	[1] 91,544	6,594	323	291	498	108
1881	868,000	19,515	[2] 92,744	7,124	457	486	645	17
1882	886,539	20,059	[2] 94,004	7,254	933	310	650	91
1883	907,041	20,076	95,234	7,417	1,006	561	579	58
1884	927,995	19,999	96,465	7,606	680	540	662	96
1885	949,432	21,392	97,695	8,188	600	375	610	131
1886	971,363	20,005	98,925	7,351	411	248	618	19
1887	993,801	21,719	100,155	8,421	416	159	621	358
1888	1,016,758	20,372	101,386	7,269	350	235	785	24
1889	1,040,245	20,536	102,616	7,752	375	298	736	92
1890[1]	1,046,964	21,732	[1] 103,847	7,913	528	189	666	105
1891	1,069,264	23,367	105,077	8,479	918	341	684	25
1892	1,092,168	24,305	....	9,305	1,425	484	539	74
1893	1,115,562	23,655	....	8,690	892	267	456	88
1894	1,139,457	22,680	....	8,160	1,047	154	369	33
1895	1,163,864	23,797	....	8,401	1,020	79	469	84
1896	1,188,793	23,982	....	8,661	862	61	402	191
1897	1,214,256	22,735	....	7,605	1,231	282	401	64
1898	1,240,266	23,790	....	7,998	998	114	[3] 639	234
1899	1,266,832	23,796	....	7,056	849	132	948	7

[1] Census years. [2] Estimated on the increase of census years.
[3] Seventy-three of these were soldiers who contracted the disease in camps.

(Old City of) New York, N. Y.

YEARS.	Population.	Total Deaths.	Population of Children under 5 yrs. of age.[1]	Deaths of Children under 5 yrs. of age.	Deaths from Diphtheria.	Deaths from Scarlatina.	Deaths from Typhoid Fever.	Deaths from Measles.
1880.[1]	1,209,268	31,937	140,673	14,650	1,390	618	372	479
1881	1,246,011	38,624	144,947	17,737	2,249	1,964	594	429
1882	1,283,870	37,924	149,351	17,520	1,525	2,066	516	913
1883	1,322,880	34,011	153,889	13,856	1,009	744	625	716
1884	1,363,075	35,044	158,565	15,272	1,090	608	476	762
1885	1,404,401	35,682	163,383	15,267	1,325	559	405	736
1886	1,447,166	37,351	168,347	16,121	1,727	371	433	668
1887	1,491,137	38,933	173,462	16,766	2,167	569	421	767
1888	1,536,444	40,175	178,733	17,358	1,914	1,361	364	591
1889	1,583,120	39,679	184,164	17,152	1,686	1,242	397	470
1890	1,631,232	40,103	189,760	16,305	1,262	408	352	730
1891	1,680,796	43,659	195,525	18,224	1,361	1,220	384	663
1892	1,827,396	44,317	....	18,589	1,425	975	399	863
1893	1,891,306	44,479	....	17,914	1,968	552	381	390
1894	1,957,452	41,175	....	17,596	2,359	541	326	584
1895	1,879,195	43,420	210,523	18,221	1,634	468	322	793
1896[1]	1,934,077	41,622	210,523	16,807	1,555	402	297	714
1897	1,990,562	38,887	226,327	15,394	1,377	500	299	391
1898	2,048,830	40,438	233,150	15,591	922	524	376	446
1899	2,117,106	39,911	240,714	14,391	940	332	294	379

[1] Estimated July 1, 1896.

Chicago, Ill.

YEARS.	Population Estimated.	Total Deaths.	Population of Children under 5 yrs. of age.	Deaths of Children under 5 yrs. of age.	Deaths from Diphtheria.	Deaths from Scarlatina.	Deaths from Typhoid Fever.	Deaths from Measles.
1880............	503,298	10,462						
1881............	540,000	13,874						
1882............	560,639	13,234	....	6,645				
1883............	580,000	11,555	....	5,875				
1884............	630,000	12,471	....	6,666				
1885............	665,000	12,474	....	6,187	706	279	496	78
1886............	704,000	13,699	....	6,763	944	220	483	126
1887............	760,000	15,409	....	7,568	1,002	190	381	341
1888............	830,000	15,772	....	7,533	858	184	375	151
1889............	1,106,000	16,946	....	8,204	1,126	185	453	204
1890............	1,200,000	21,869	....	9,954	881	193	1,008	67
1891............	1,250,000	27,754	....	12,801	958	499	1,997	265
1892............	1,438,000	26,219	....	11,662	1,014	382	1,489	185
1893............	1,600,000	27,095	....	12,364	975	329	670	234
1894............	1,567,727	23,701	....	12,363	841	190	491	182
1895............	1,600,000	24,319	227,200	10,449	1,775	77	518	158
1896............	[1]1,619,226	23,262	192,453	15,336	955	54	751	73
1897............	1,619,226	21,809	192,453	8,546	702	81	437	139
1898............	1,650,000	22,747	196,193	8,135	622	67	636	55
1899............	1,950,000	25,503	196,299	8,880	843	533	442	168

[1] School census, July 1, 1896.

Brooklyn, N. Y.

YEARS.	Population.	Total Deaths.	Population of Children under 5 yrs. of age.	Deaths of Children under 5 yrs. of age.	Deaths from Diphtheria.	Deaths from Scarlatina.	Deaths from Typhoid Fever.	Deaths from Measles.	Deaths from Consumption.
1885........	687,000	15,369	89,310	6,756	519	363	153	175	1,995
1886........	747,000	15,790	97,110	7,000	782	340	123	106	2,085
1887........	778,800	17,079	101,140	7,577	950	271	143	172	2,026
1888........	810,000	18,061	105,300	8,019	984	475	153	59	2,051
1889........	842,000	18,480	109,460	8,265	1,101	273	161	205	2,055
1890........	875,000	19,827	113,750	8,462	902	227	182	111	2,169
1891........	910,000	21,349	118,300	9,388	766	485	180	203	2,117
1892........	945,000	20,807	122,850	8,971	775	412	162	168	2,128
1893........	980,000	21,017	127,400	8,763	607	307	179	111	2,174
1894........	1,045,000	21,183	135,850	9,235	1,279	188	158	204	2,260
1895........	1,110,000	22,568	124,000	9,277	1,139	124	173	192	2,299
1896........	1,125,000	22,497	146,000	9,006	1,063	150	163	333	2,245
1897........	1,160,000	20,674	130,500	8,252	795	187	173	190	2,164
1898........	1,197,100	21,856	134,793	8,414	742	159	267	193	2,384
1899........	1,231,548	21,649	....	8,072	583	175	205	197	2,435

St. Louis.

YEARS.	Population.	Total Deaths.	Deaths of Children under 5 yrs. of age.	Deaths from Diphtheria.		Deaths from Scarlet Fever.	Deaths from Typhoid Fever.	Deaths from Measles.	Deaths from Consumption.
				Diph. —	*Croup.*				
1885	400,000	7,490	3,090	372 —	109	164	125	54	888
1886	400,000	8,268	3,434	719 —	160	149	124	6	915
1887	420,000	9,155	3,795	927 —	185	48	116	40	829
1888	440,000	9,015	3,659	564 —	167	30	130	31	800
1889	450,000	8,004	3,149	345 —	94	114	146	63	655
1890	460,000	8,409	3,115	186 —	58	87	140	1	848
1891	480,000	9,530	3,493	250 —	90	96	165	53	869
1892	500,000	10,225	3,607	195 —	91	150	441	7	882
1893	520,000	10,303	3,548	227 —	144	79	215	26	984
1894	540,000	8,710	3,192	240 —	139	29	171	3	875
1895	560,000	9,425	3,373	512 —	171	18	107	38	1,000
1896	570,000	9,897	3,326	273 —	....	11	108	17	1,026
1897	600,000	9,554	2,799	170 —	70	19	123	1	997
1898	623,000	8,908	3,358	152 —	51	28	95	21	1,001
1899	640,000	10,024	3,005	192 —	....	34	131	15	1,091

London, England.

YEARS.	Population.	Total Deaths.	Population of Children under 5 years of age.	Deaths of Children under 5 years of age.	Deaths from Diphtheria.	Deaths from Scarlatina.	Deaths from Typhoid Fever.	Deaths from Measles.
1880	3,771,139	81,832	....	36,220	544	3,100	702	1,521
1881	3,824,960	81,071	497,044	33,325	654	2,108	977	2,533
1882	3,861,876	82,905	....	36,259	863	2,004	975	2,329
1883	3,901,164	80,578	....	33,552	951	1,989	935	2,420
1884	3,939,832	83,050	....	36,030	973	1,444	936	2,285
1885	3,978,883	80,000	....	32,913	896	707	585	2,928
1886	4,018,321	82,276	....	34,319	846	688	618	2,078
1887	4,058,150	82,304	....	35,236	953	1,419	612	2,904
1888	4,098,374	79,099	....	32,669	1,811	1,190	694	2,425
1889	4,138,996	76,026	....	30,469	1,616	771	528	2,308
1890	4,180,021	89,554	....	36,123	1,417	876	618	3,291
1891	4,221,452	90,216	501,558	33,340	1,361	589	547	1,807
1892	4,263,294	87,749	....	34,560	1,885	1,174	436	3,393
1893	4,306,411	91,536	....	35,200	3,265	1,596	719	1,661
1894	4,349,166	77,039	....	31,366	2,670	962	635	3,293
1895	4,392,346	86,937	....	35,095	2,316	829	614	2,633
1896	4,421,955	83,511	....	35,599	2,683	942	591	3,697
1897	4,463,169	80,944	....	32,238	2,263	781	593	1,928
1898	4,504,766	83,936	536,522	34,184	1,772	583	585	3,075
1899	4,506,752	89,689	541,523	32,073	1,964	398	801	2,143

Paris, France.

YEARS.	Population.	Total Deaths.	Population of Children under 5 years of age.[1]	Deaths of Children under 5 years of age.	Deaths from Diphtheria.	Deaths from Scarlatina.	Deaths from Typhoid Fever.	Deaths from Measles.
1880	....	55,706	....	17,674	2,048	345	2,003	962
1881	2,239,938	55,103	148,601	17,159	2,211	440	1,955	897
1882	....	56,854	....	17,158	2,244	156	3,214	1,005
1883	....	54,763	....	16,843	1,781	88	1,880	1,043
1884	....	55,059	....	16,968	1,928	155	1,503	1,501
1885	....	52,726	....	15,244	1,655	191	1,320	1,524
1886	2,260,945	55,110	146,177	16,493	1,512	403	954	1,210
1887	....	52,836	....	15,206	1,585	224	1,385	1,628
1888	....	51,230	....	14,463	1,729	193	756	915
1889	....	54,083	....	14,679	1,706	170	1,008	1,190
1890	....	54,566	150,490	15,068	1,668	223	665	1,495
Census of 12th April, 1891.	2,424,705							
1891	2,424,705	54,443	150,490	14,048	1,531	208	549	1,020
1892	2,424,705	54,536	150,490	14,353	1,403	198	691	999
1893	2,424,705	52,955	....	13,046	1,266	177	570	677
1894	2,424,705	[2] 49,205	150,490	11,901	1,009	151	697	993
1895	2,424,705	51,451	....	....	421	179	274	682
1896	2,511,629	47,929	188,941	10,363	444	190	262	656
1897	2,511,629	46,988	156,494	10,528	298	65	249	821
1898	2,511,629	49,574	156,494	11,671	259	138	256	876
1899	2,511,629	50,511	....	....	336	196	754	901

[1] Estimated, 1891.

[2] Inhabitants of Paris only.

Berlin, Germany.

YEARS.	Population.	Total Deaths.[1]	Population of Children under 5 yrs. of age.	Deaths of Children under 5 yrs. of age.[2]	Deaths from Diphtheria.	Deaths from Scarlatina.	Deaths from Typhoid Fever.	Deaths from Measles.
Beginning	1,089,070	....	142,476					
1880	....	32,823	....	19,249	1,198	872	527	376
End	1,123,749	....	183,060					
1881	....	31,055	....	17,483	1,593	903	352	201
End	1,158,559	....	143,828					
1882	....	30,465	....	16,990	1,914	604	357	144
End	1,196,205	....	146,138					
1883	....	35,056	....	19,902	2,651	867	222	1,173
End	1,232,716	....	144,464					
1884	....	32,932	....	18,440	2,446	395	243	295
End	1,271,677	....	144,620					
1885	....	31,483	....	15,558	1,816	409	214	406
End	1,315,656	....	146,227					
1886	....	34,293	....	19,215	1,585	271	181	565
End	1,363,031							
1887	....	30,336	....	15,777	1,305	257	193	223
End	1,415,269							
1888	....	29,298	....	15,076	1,018	201	188	364
End	1,472,151							
1889	....	34,460	....	18,394	1,189	244	290	201
End	1,528,721							
1890	....	33,393	....	17,630	1,492	298	143	441
End	[1]1,579,524	....	[2]164,370					
1891	1,601,827	....	....	16,800	1,010	150	166	130
1892	1,656,715	32,696	172,378	16,319	1,325	53	137	217
1893	1,714,938	36,032	....	....	1,578	582	161	341
1894	1,655,235	30,961	176,200	14,649	1,361	443	69	203
1895	1,677,304	33,627	164,258	16,034	934	817	95	175
1896	1,695,313	30,578	....	13,443	515	333	80	111
1897	1,758,885	30,622	58,339	13,825	507	217	71	161
1898	1,805,054	30,571	56,751	13,595	608	268	78	119
1899	1,817,952	34,011	166,888	14,878	609	525	74	530

[1] Census of December 1, 1890.

[2] Excluded: Still-born, 1,749, 1,771, 1,759, 1,707, 1,778, 1,848, 1,710, 1,761, 1,756, 1,789, 1,473.

Vienna, Austria.

YEARS.	Population.	Total Deaths.	Population of Children under 5 yrs. of age.	Deaths of Children under 5 yrs. of age.	Deaths from Diphtheria and Croup.	Deaths from Scarlatina.	Deaths from Typhoid Fever.	Deaths from Measles.
1880	721,016	20,453	58,023	8,219	597	172	171	98
1881	731,208	21,549	....	8,224	539	286	171	106
1882	740,919	21,595	....	8,903	522	410	187	203
1883	750,762	21,194	....	7,930	360	150	157	246
1884	759,849	20,353	....	7,688	342	180	95	344
1885	769,889	21,976	....	8,668	464	83	106	289
1886	780,066	20,869	....	8,114	546	124	85	338
1887	790,381	20,549	....	7,912	455	391	80	493
1888	800,836	20,349	....	7,547	521	230	107	253
1889	811,434	20,106	....	7,624	513	139	103	364
1890	822,176	20,324	69,710	7,853	536	92	77	459
1891	1,378,530	34,479	130,808	15,610	1,311	271	85	855
1892	1,406,933	35,134	....	16,843	1,580	242	116	825
1893	1,435,931	34,515	130,808	15,002	1,615	311	105	1,225
1894	1,465,637	33,944	140,545	15,073	1,679	413	74	898
1895	1,495,764	34,879	....	15,021	710	437	86	754
1896	1,526,623	34,132	....	14,685	621	436	79	930
1897	1,551,129	33,187	....	13,946	575	236	84	857
1898	1,590,295	32,356	....	13,593	520	227	93	794
1899	1,623,134	33,333	....	....	463	261	66	684

Glasgow, Scotland.

YEARS.	Population.	Total Deaths.	Population of Children under 5 yrs. of age.	Deaths of Children under 5 yrs. of age.	Deaths from Diphtheria.	Deaths from Scarlatina.	Deaths from Typhoid Fever.	Deaths from Measles.
1880	....	13,303	....	6,071	150	453	278	331
1881 census	511,415	12,909	69,931	5,386	162	256	166	333
1882	....	12,985	....	5,972	177	263	162	213
1883	....	14,476	....	6,494	132	449	167	605
1884	....	13,839	....	6,174	157	412	184	335
1885	....	13,444	....	6,156	112	288	102	430
1886	....	13,053	....	5,601	111	345	81	90
1887	....	12,055	....	5,367	174	234	100	302
1888	....	11,533	....	4,743	168	163	59	205
1889	....	12,890	....	5,970	167	109	111	594
1890	....	13,222	....	5,768	139	124	108	583
1891 census	565,710	14,149	72,481	5,432	131	201	123	400
1892	669,059	15,128	84,860	6,306	162	304	102	781
1893	677,883	15,798	85,968	6,953	208	263	120	855
1894	686,820	13,674	87,103	5,326	245	204	150	250
1895	695,876	16,332	88,250	6,458	112	180	121	330
1896	705,052	14,388	89,413	6,153	83	139	139	814
1897	714,419	15,727	90,665	6,750	97	132	172	574
1898	724,349	15,333	91,861	6,530	103	188	223	536
1899	733,903	15,828	93,073	6,196	106	202	179	546

Liverpool, England.

YEARS.	Population.	Total Deaths.	Population of Children under 5 yrs. of age.	Deaths of Children under 5 yrs. of age.	Deaths from Diphtheria.	Deaths from Scarlatina.	Deaths from Typhoid Fever.	Deaths from Measles.
1884	541,031	14,382	....	6,908	80	197	112	611
1885	537,548	13,764	....	6,213	133	190	95	716
1886	534,088	13,919	....	6,152	125	277	140	273
1887	530,649	14,006	....	6,218	95	321	130	661
1888	527,233	12,159	....	5,070	66	187	125	331
1889	523,838	13,047	....	5,921	57	352	167	485
1890	520,466	14,293	....	6,319	104	577	99	535
1891	517,145	13,911	....	5,697	63	119	92	320
1892	513,818	12,671	....	5,322	47	131	111	456
1893	510,514	13,919	....	6,035	47	231	221	273
1894	507,230	12,073	64,544	5,214	65	232	248	299
1895	638,291	16,215	78,411	7,201	97	168	192	397
1896	632,512	14,617	....	....	157	227	206	306
1897	644,129	15,590	78,411	6,972	91	209	145	344
1898	668,645	15,380	....	6,489	123	145	148	283
1899	668,645	16,269	83,042	7,039	189	164	174	320

CHART NO. 1.

Comparative View of Twenty-five of the Principal Causes of Death during the Year 1899.

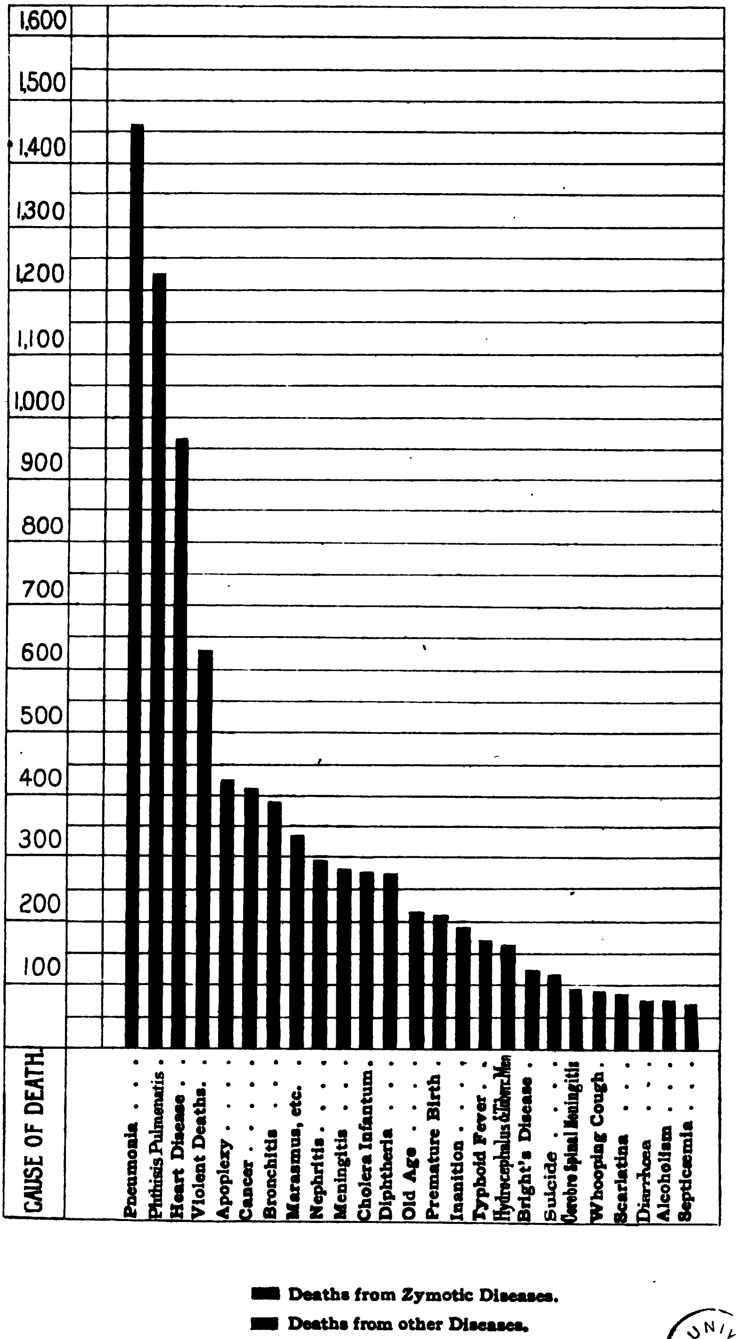

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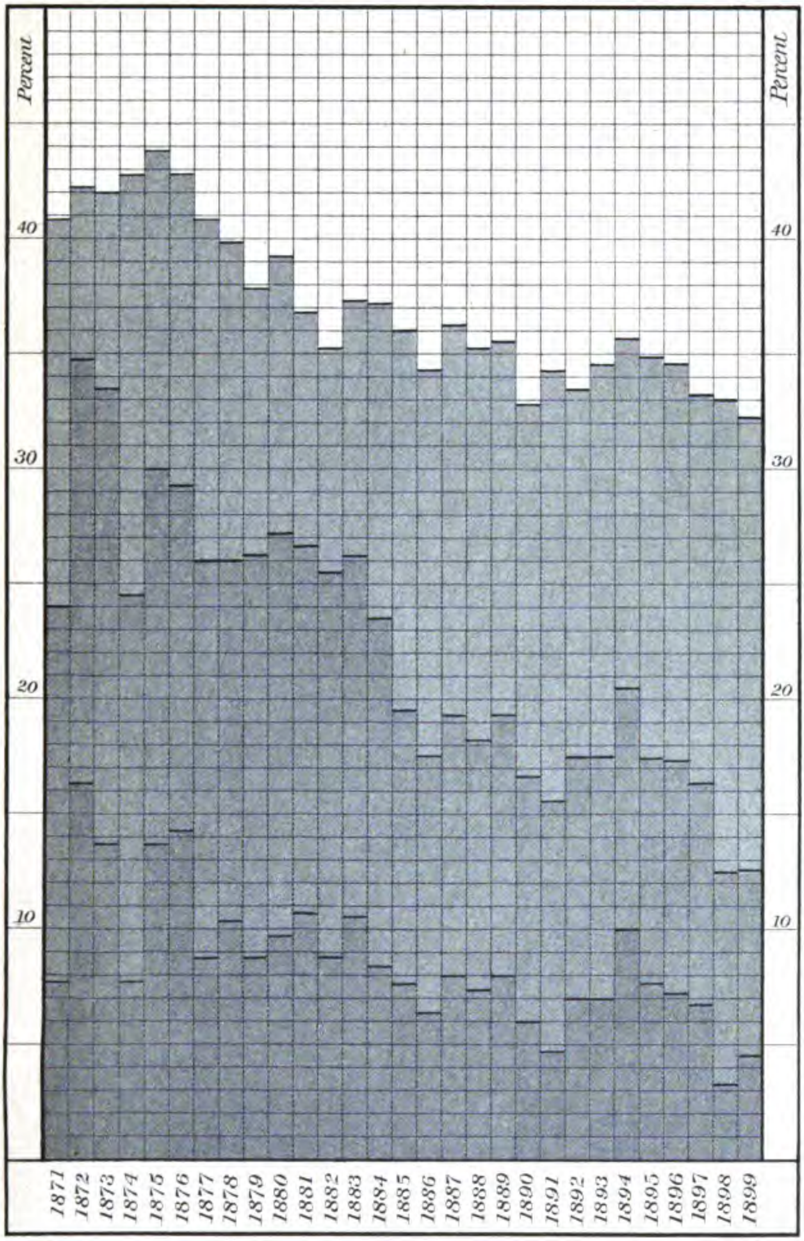
CHART NO. 2.

Percentage of Deaths of Children under five years of age,
ZYMOTIC DEATHS, AND FIVE OF THE PRINCIPAL INFECTIOUS DISEASES
to the total mortality for twenty-nine years ending 1899.



Percentage of Children under five years of age to total mortality . ▨
" of Zymotic deaths to total mortality . . . . ▩
" of Diphtheria, Scarlet Fever. Measles, Typhoid Fever,
and Small-Pox to total mortality . . . . ■

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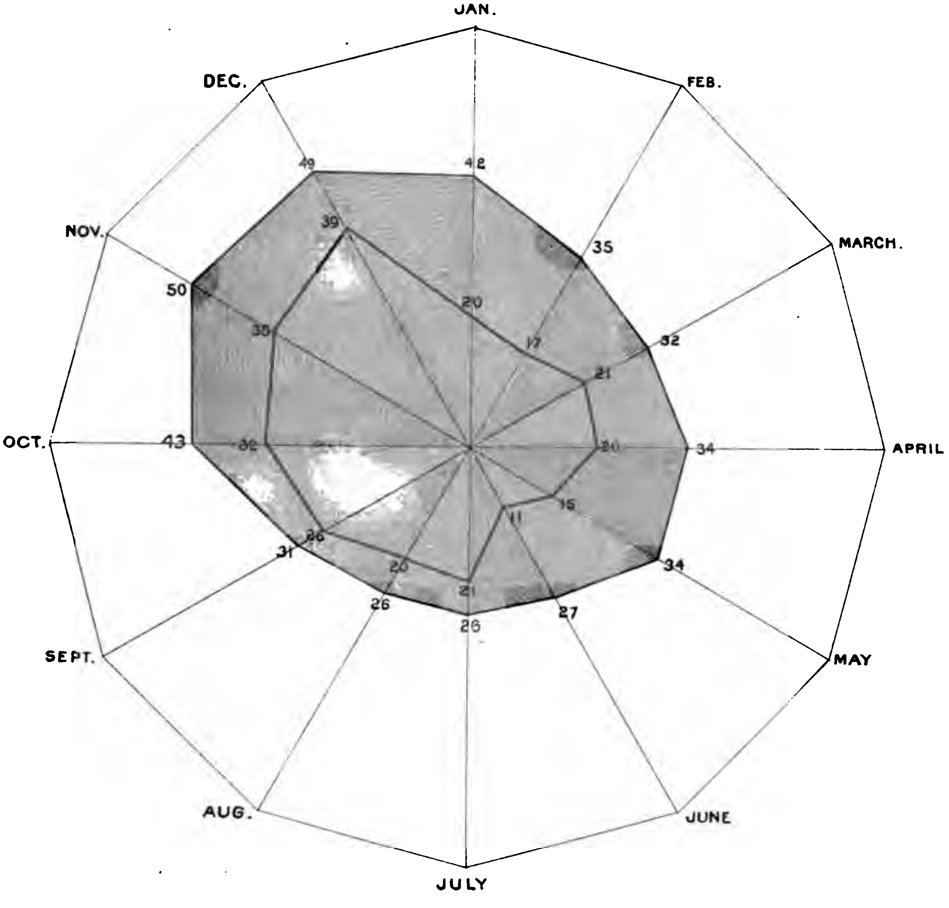
CHART NO. 4.

DIPHTHERIA.



——— Average deaths per month for ten years, 1890-1899.

——— Deaths per month for the year 1899.

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Table I. — Total of Deaths, Still-births and Deaths from Zymotic Diseases, for Twenty-nine years, with Percentages.

YEARS.	Total Deaths, exclusive of still-births.	Still-births.	Total Zymotics.	Diphtheria and Croup.	Scarlet Fever.	Typhoid Fever.	Cerebro-spinal Meningitis.	Whooping-cough.	Measles.	Diarrhœal Diseases.	Small-pox.	Percentage of Zymotic Deaths to total Mortality.	Rate of Still-births per 1,000 Inhabitants.
1871	5,888	543	1,408	128	111	176	3	30	9	756	23	23.91	1.88
1872	8,090	560	2,823	94	258	229	60	52	60	1,006	738	34.89	1.91
1873	7,869	515	2,626	119	474	243	216	33	16	925	302	33.37	1.76
1874	7,812	642	1,899	121	269	202	35	108	41	940	2	24.30	2.19
1875	9,060	541	2,722	631	534	227	41	41	65	989	1	30.02	1.28
1876	8,253	485	2,439	720	458	145	13	59	2	827	2	29.55	1.41
1877	7,316	471	1,890	471	104	156	24	88	2	913	4	25.83	1.37
1878	7,636	441	1,980	569	68	120	19	88	145	816	....	25.91	1.28
1879	7,398	453	1,935	545	149	119	15	112	2	772	....	26.15	1.24
1880	8,531	443	2,321	774	33	154	8	94	49	1,003	1	27.20	1.22
1881	9,016	513	2,423	802	35	207	16	77	108	870	6	26.87	1.29
1882	8,995	518	2,276	575	75	212	24	92	25	951	8	25.30	1.26
1883	9,740	504	2,551	608	211	198	23	31	152	1,023	1	26.19	1.17
1884	9,622	503	2,278	487	209	216	26	181	13	855	1	23.67	1.17
1885	9,618	520	1,879	450	156	152	19	26	84	723	2	19.53	1.30
1886	9,268	543	1,644	423	81	135	14	37	36	705	....	17.73	1.35
1887	10,073	534	1,993	410	195	183	16	82	119	734	....	19.70	1.33
1888	10,197	552	1,841	589	65	170	19	74	27	669	2	18.05	1.33
1889	10,259	598	1,968	683	23	186	21	96	48	710	2	19.18	1.42
1890	10,181	627	1,677	462	42	155	17	39	19	665	....	16.47	1.39
1891	10,571	614	1,615	285	64	154	21	39	21	755	....	15.27	1.33
1892	11,236	633	2,014	481	262	137	12	45	19	693	....	17.92	1.34
1893	11,710	605	2,042	546	248	148	15	40	27	635	....	17.43	1.24
1894	11,520	700	2,357	878	192	141	18	111	8	700	22	20.46	1.39
1895	11,329	607	1,968	654	114	163	15	47	19	627	....	17.37	1.21
1896	11,634	648	1,985	572	112	162	21	67	27	713	....	17.06	1.25
1897	11,154	614	1,806	456	136	173	185	39	21	522	....	16.19	1.16
1898	10,886	613	1,470	185	33	185	97	68	27	599	....	13.50	1.13
1899	11,167	539	1,444	304	74	165	88	76	33	396	5	12.93	.97

Table II. — Total Number of Deaths under Five Years, and Five Years and over, for Twenty-nine Years, with Percentages to the Total Mortality.

Years.	Total Deaths	Five Years and over.	Under Five Years.	Percentages.	
				Five Years and over.	Under Five Years.
1871	5,888	3,493	2,395	59.33	40.67
1872	8,090	4,676	3,414	57.79	42.21
1873	7,869	4,580	3,289	58.20	41.80
1874	7,812	4,454	3,358	57.01	42.99
1875	9,060	5,088	3,972	56.16	43.84
1876	8,253	4,722	3,531	57.22	42.78
1877	7,316	4,334	2,982	59.24	40.76
1878	7,636	4,630	3,006	60.63	39.87
1879	7,398	4,593	2,805	62.08	37.92
1880	8,531	5,182	3,349	60.74	39.26
1881	9,016	5,702	3,314	63.24	36.76
1882	8,995	5,844	3,151	64.97	35.03
1883	9,740	6,113	3,627	62.76	37.24
1884	9,622	6,052	3,570	62.90	37.10
1885	9,618	6,152	3,466	63.97	36.03
1886	9,268	6,082	3,186	55.63	34.37
1887	10,073	6,411	3,662	63.55	36.35
1888	10,197	6,598	3,599	64.71	35.29
1889	10,259	6,626	3,633	64.59	35.41
1890	10,181	6,832	3,349	67.11	32.89
1891	10,571	6,963	3,608	65.87	34.13
1892	11,236	7,501	3,735	66.76	33.24
1893	11,710	7,723	3,987	65.96	34.04
1894	11,520	7,412	4,108	64.34	35.66
1895	11,329	7,394	3,935	65.27	34.73
1896	11,634	7,579	4,055	65.15	34.85
1897	11,154	7,446	3,708	66.76	33.24
1898	10,886	7,309	3,577	67.14	32.86
1899	11,167	7,576	3,591	67.84	32.16

Table III. — Deaths during the Year 1899, by Sex, Condition, Color, Nativity, Parentage, and Season.

	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
Total number of deaths	1,150	912	925	972	880	780	967	957	876	841	874	1,033	11,167
Sex :													
Males	588	487	469	510	472	398	502	505	447	410	457	523	5,768
Females	562	425	456	462	408	382	465	452	429	431	417	510	5,399
Condition :													
Married	386	317	274	327	263	260	239	229	266	254	264	337	3,416
Single	537	439	495	468	442	406	612	600	489	443	462	512	5,905
Widows	168	106	105	114	114	75	74	89	88	102	107	115	1,257
Widowers	53	42	43	58	54	31	39	37	27	31	35	59	509
Unknown	6	8	8	5	7	8	3	2	6	11	6	10	80
Color :													
White	1,117	886	905	956	855	756	940	927	852	818	849	1,006	10,867
Colored	33	26	20	16	25	24	27	30	24	23	25	27	309
Nativity :													
United States	721	598	601	600	558	499	677	675	597	509	556	668	7,259
Ireland	219	171	151	198	166	128	139	138	146	180	162	192	1,990
England	29	15	16	19	12	20	19	16	16	22	19	28	231
Scotland	7	7	6	6	8	10	8	9	8	11	4	9	93
Germany	20	13	30	13	17	19	22	15	8	9	16	12	194
British Provinces	85	58	68	60	68	59	53	53	49	50	75	58	736
Italy	17	15	11	18	14	10	9	11	8	12	10	11	146
Russia	13	11	9	14	9	8	9	11	14	14	9	9	130
Other countries	20	13	20	28	5	14	20	20	19	25	11	27	232
Unknown	19	11	13	16	13	13	11	9	11	9	12	19	156
Parentage :													
American	271	217	218	188	186	166	201	212	190	169	207	228	2,453
Irish	392	305	275	342	303	244	305	282	284	309	282	353	3,676
English	32	24	13	23	17	13	15	20	18	22	18	26	241
Scotch	13	11	13	13	11	14	4	6	13	10	13	7	128
German	24	19	28	24	25	24	28	21	21	19	24	19	276
British Provinces	68	58	64	58	63	48	66	69	50	54	61	55	714
Italian	39	38	41	47	33	23	31	30	35	20	25	39	401
Russian	24	24	20	27	19	18	29	27	36	30	19	38	311
Other countries	65	48	75	70	52	59	85	91	53	69	67	68	802
Mixed	78	67	66	76	62	60	93	90	80	48	76	85	881
[1]Unknown	144	101	112	104	109	111	110	109	96	91	82	115	1,284

[1] This includes deaths where one parent is unknown.

Table IV.—Deaths from Principal Zymotic Diseases.

	Total Deaths from each Cause.	Percentage of each Cause to Total Mortality.	Death per 1,000 Inhabitants.	Total Deaths per Sex.		Total Deaths per Sex under Five Years.		Total Deaths under Five Years.	Percentage of each Cause under Five Years to Total Mortality.
				M.	F.	M.	F.		
Small-pox	5	.045	.009	3	2	1	1	2	.018
Measles	33	.295	.059	16	17	12	15	27	.242
Scarlatina	74	.662	.133	34	40	23	25	48	.430
Diphtheria	277	2.480	.499	134	143	91	93	184	1.648
Croup	27	.242	.048	17	10	15	8	23	.206
Whooping-cough	76	.680	.137	31	45	31	45	76	.680
Typhoid fever	165	1,477	.297	99	66	2	......	2	.018
Erysipelas	42	.376	.076	27	15	11	4	15	134
Puerperal fever	11	.098	.020	......	11				
Carbuncle	2	.018	.004	2					
Dysentery	31	.277	.056	10	21	4	2	6	.054
Diarrhœa	69	.618	.124	37	32	26	18	44	.394
Cholera morbus	16	.143	.029	6	10	1	......	1	.009
Cholera infantum	280	2.507	.504	152	128	151	127	278	2.489
Cerebro-spinal fever	88	.788	.158	54	34	24	17	41	.367
Influenza	49	.439	.088	27	22	4	3	7	.063
Intermittent fever	1	.009	.002	......	1	......	1	1	.009
Rhuematism	17	.152	.030	6	11	......	2	2	.018
Pyæmia	12	.107	.022	5	7	2	2	4	.036
Syphilis, congenital	22	.197	.040	15	7	15	7	22	.197
Syphilis, tertiary	5	.045	.009	3	2				
Purpura	3	.027	.005	3	......	2	......	2	.018
Alcoholism	68	.609	.122	46	22				
Septicæmia	61	.546	.110	23	38	4	4	8	.072
Typhus fever									
Tonsillitis	1	.009	.002	......	1	......	1	1	.009
Remittent fever									
Yellow fever									

Table V.—Yearly Percentages of Principal Zymotic Deaths from 1879 to 1899, inclusive, to Total Mortality.

	1879.	1880.	1881.	1882.	1883.	1884.	1885.	1886.	1887.	1888.	1889.	1890.	1891.	1892.	1893.	1894.	1895.	1896.	1897.	1898.	1899.
Small-pox	......	.011	.066	.088	.010	.010	.020	......	......	.019	.019	......	......	......	.034	.190	......	......	......	......	.045
Measles	.027	.574	1.197	.277	1.560	.135	.873	.388	1.181	.264	.468	.186	.198	.169	.230	.069	.167	.234	.188	.248	.295
Scarlatina	2.014	.386	.388	.833	2.166	2.172	1.621	.873	1.935	.637	.224	.412	.605	2.331	2.118	1.666	1.006	1.040	1.219	.303	.662
Diphtheria	5.285	6.892	6.665	5.091	4.568	3.585	3.472	3.519	3.137	4.609	5.498	3.938	2.194	3.684	4.064	7.092	5.190	4.435	3.684	1.562	2.480
Croup	2.081	2.180	2.229	1.300	1.673	1.475	1.299	1.014	.933	1.167	1.160	.599	.501	.596	.597	.529	.582	.481	.403	.138	.242
Whooping-cough	1.513	1.101	.854	1.022	.318	1.881	.270	.399	.814	.725	.936	.383	.368	.400	.341	.963	.414	.576	.349	.625	.680
Typhoid fever	1.608	1.804	2.295	2.356	2.032	2.245	1.580	1.456	1.816	1.667	1.813	1.522	1.456	1.219	1.263	1.223	1.438	1.392	1.551	1.699	1.477
Erysipelas	.527	.281	.465	.444	.431	.448	.415	.420	.337	.402	.234	.353	.368	.329	.478	.277	.300	.258	.287	.276	.376
Puerperal fever	.851	.726	.754	.833	.728	.467	.207	.183	.228	.176	.117	.265	.170	.249	.239	.138	.123	.172	.117	.073	.098
Carbuncle	.027	.035	.055	.044	.020	.031	.072	.032	......	......	.019	.058	.018	.035	.025	.008	......	.017	.027	.037	.018
Dysentery	1.365	1.488	1.064	.922	.903	.663	.644	.658	.585	.470	.741	.294	.454	.266	.333	.329	.379	.378	.161	.377	.277
Diarrhœa	2.487	2.056	2.606	2.568	2.731	2.286	1.767	1.855	1.578	1.510	1.589	1.119	.851	.685	.709	.607	.609	.559	.780	.937	.618
Cholera morbus	.351	.445	.177	.511	.246	.509	.319	.302	.258	.264	.214	.225	.189	.204	.119	.199	.132	.249	.152	.138	.143
Cholera infantum	5.117	6.071	4.924	5.625	5.574	5.372	4.793	4.790	4.894	4.314	4.386	4.891	5.647	5.010	4.261	4.939	4.413	4.942	3.586	4.051	2.507
Cerebro-spinal fever	.202	.105	.177	.266	.236	.270	.197	.151	.158	.186	.205	.166	.198	.106	.128	.156	.132	.180	1.659	.891	.788
Intermittent fever	.013	.058	.033	.023	.010	.010	.031	......	......	.009	......	......	.018	......	.051	.034	.044	.043	.009	.009	.009
Remittent fever	.081	.082	.044	.011	.010	......	.020	.053	......	.109	......	......	.009	.008	.017	.130	.008	.009	......	.009	......
Rheumatism	.378	.222	.454	.333	.215	.270	.405	.302	.436	.274	.302	.196	.217	.382	.273	.104	.185	.180	.134	.184	.152
Pyæmia	.175	.048	.155	.233	.154	.176	.114	.183	.138	.098	.078	.127	.141	.080	.111	.190	.044	.069	.054	.064	.107
Syphilis, congenital	.243	.128	.221	.133	.184	.280	.218	.215	.268	.254	.214	.392	.198	.106	.153	.078	.229	.344	.197	.165	.197
Syphilis, tertiary	.094	.093	.088	.100	.133	.051	.503	.075	.079	.039	.097	.029	.047	.026	.068	.052	.070	.051	.080	.083	.045
Purpura	......	.058	.055	.011	.092	.011	.020	.075	.039	.039	.029	.058	.056	.026	.059	.564	.070	.077	.134	.064	.027
Alcoholism	.554	.644	.820	1.045	.687	.737	.571	.420	.585	.519	.604	.746	.614	.640	.717	.355	.617	.739	.394	.524	.609
Septicæmia	.175	.187	.122	.133	.277	.270	.322	.280	.228	.166	.175	.176	.274	.249	.367	......	.547	.456	.600	.569	.546
Yellow fever	......	......	......	......	......	.010	.010	......	......	......	......	......	......	......	......	......	......	......	.009	......	......
Tonsillitis	.040	......	......	.033	.102	......	.051	.043	.049	.068	.009	.009	.028	.080	.025	.017	.017	.017	.018	......	.009

Table VI. — Ten of the Principal Causes of Death, by Sex and Month, with Nativity of Parents.

	Jan.		Feb.		Mar.		Apr.		May.		June.		July.		Aug.		Sept.		Oct.		Nov.		Dec.		Total.		NATIVITY OF PARENTS.											
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	United States.	Ireland.	England.	Scotland.	Germany.	British Prov.	Italy.	Russia.	Other Countries.	Mixed.	Unknown.	Total.
Pneumonia	139	141	101	74	70	68	79	72	65	49	41	35	21	18	23	23	22	32	39	43	70	52	93	85	763	692	319	473	29	21	34	99	86	40	85	119	150	1,455
Phthisis pulmonalis	66	63	59	46	72	56	64	52	66	51	43	45	52	50	49	40	39	33	49	55	46	38	54	48	659	577	146	600	21	17	41	87	17	19	121	68	99	1,236
Heart disease	41	54	47	47	39	40	46	41	46	31	30	30	36	28	30	27	30	45	32	42	42	61	52	49	471	495	215	394	20	15	28	46	16	21	55	31	125	966
Violent deaths	37	10	38	17	30	15	35	13	26	10	41	19	33	18	44	4	40	10	41	19	49	12	43	16	457	163	120	189	18	7	17	51	20	20	44	31	103	620
Apoplexy	25	21	14	20	18	20	13	22	8	16	21	21	15	15	20	17	19	13	13	20	13	13	30	21	209	219	121	142	13	5	10	20	8	2	19	14	74	428
Cancer	8	21	6	18	8	27	15	25	14	18	12	28	10	21	12	15	10	18	10	28	10	33	10	25	125	277	102	136	12	7	18	33	5	9	18	9	53	402
Bronchitis	25	43	19	19	10	22	26	16	9	18	6	11	5	8	6	10	7	11	14	15	21	22	26	24	174	219	64	162	6	2	11	22	34	10	25	34	23	393
Marasmus, etc.	10	10	12	5	13	9	12	10	6	8	10	10	12	11	30	27	30	19	15	20	11	14	14	10	175	153	87	64	5	..	4	19	17	4	27	56	45	328
Nephritis	14	12	10	16	17	9	15	19	15	10	12	13	11	12	9	7	15	11	11	11	18	6	15	10	162	136	72	110	7	4	12	8	5	1	19	20	40	298
Meningitis	9	8	22	10	15	11	21	12	11	11	14	14	18	11	8	10	14	9	9	9	13	6	7	9	161	120	77	66	1	3	5	23	15	11	21	43	16	281

Table VII.—Ten of the Principal Causes of Death, arranged by Age and Sex.

	Under 1 yr.		1 yr. and under 2 yrs.		2 yrs. and under 3 yrs.		3 yrs. and under 4 yrs.		4 yrs. and under 5 yrs.		Total under 5 yrs.		5 yrs. and under 10 yrs.		10 yrs. and under 15 yrs.		15 yrs. and under 20 yrs.		20 yrs. and under 30 yrs.		30 yrs. and under 40 yrs.		40 yrs. and under 50 yrs.		50 yrs. and under 60 yrs.		60 yrs. and under 70 yrs.		70 yrs. and under 80 yrs.		80 yrs. and under 90 yrs.		90 yrs. and under 100 yrs		Over 100 yrs.		Total of all ages.	
	M.	F.	M	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M	F.
Pneumonia	139	126	91	92	32	37	14	12	9	5	285	272	12	13	3	3	9	6	49	41	102	54	96	50	77	62	66	77	43	82	17	26	4	6	...	...	763	692
Phthisis pulmonalis	12	9	9	5	2	3	...	1	...	...	23	18	3	4	1	10	37	55	173	201	198	142	124	68	64	36	21	25	14	12	1	6	...	...	...	...	659	577
Heart disease	10	11	3	2	2	4	2	4	1	1	18	22	10	8	5	5	7	10	43	39	49	48	45	56	93	94	108	106	74	73	19	30	...	4	...	...	471	495
Violent deaths	10	14	9	3	8	5	6	...	8	...	41	22	16	8	7	1	16	4	90	24	108	24	74	21	49	24	39	17	13	15	4	3	...	...	...	...	457	163
Apoplexy	4	5	1	...	...	...	1	1	...	...	6	6	1	1	...	...	...	1	2	1	16	5	23	25	40	42	58	62	47	58	15	16	1	2	...	...	209	219
Cancer	...	1	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	1	1	3	7	29	24	68	29	69	35	55	25	42	4	7	...	2	...	...	125	277
Bronchitis	80	77	18	17	3	7	2	2	1	1	104	104	2	3	2	1	1	...	4	1	4	5	7	11	11	10	12	29	15	28	11	24	1	3	...	...	174	219
Marasmus, etc.	144	118	12	17	1	...	4	2	...	...	161	137	...	...	...	1	...	1	2	2	...	...	...	2	4	1	1	...	3	7	4	2	...	...	...	...	175	153
Nephritis	6	4	...	...	...	1	2	1	...	1	8	7	...	2	2	2	8	4	7	15	31	18	15	15	34	30	30	21	22	15	4	7	1	...	...	...	162	136
Meningitis	69	49	26	26	10	9	9	4	8	2	122	90	8	10	3	2	3	3	6	5	7	3	4	4	5	3	3	...	...	...	...	...	...	...	...	...	161	120

Table VIII. — Deaths from Principal Zymotic Diseases, by Sex and Month, with Nativity of Parents.

	Jan.		Feb.		Mar.		Apr.		May.		June.		July.		Aug.		Sept.		Oct.		Nov.		Dec.		Total.		NATIVITY OF PARENTS.											
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	U.S.	Ireland.	England.	Scotland.	Germany.	British Provinces.	Italy.	Russia.	Other Countries.	Mixed.	Unknown.	Total.
Small-pox	...	...	...	...	...	...	...	...	...	1	1	1	1	...	1	...	...	...	...	...	...	...	...	...	3	2	1	3	1	..	..	...	...	...	....	..	...	5
Measles	1	2	1	...	2	7	4	3	2	2	1	1	2	1	1	...	...	...	...	...	2	1	...	...	16	17	4	8	..	..	..	5	3	...	3	6	4	33
Scarlatina	...	2	2	3	2	3	1	6	8	2	4	2	5	2	1	2	2	2	1	1	2	1	6	14	34	40	13	17	1	..	1	5	2	9	9	16	1	74
Diphtheria	11	9	11	6	15	6	10	10	5	10	7	4	9	12	10	10	11	15	16	16	13	22	16	23	134	143	68	60	3	4	4	20	23	17	28	42	8	277
Croup	1	1	2	1	1	...	1	...	2	...	...	1	2	3	...	...	3	...	1	1	2	2	2	1	17	10	5	6	..	..	1	1	5	2	2	5	...	27
Whooping-cough	3	3	2	5	4	5	1	3	1	4	3	2	5	5	6	7	3	6	1	3	2	1	...	1	31	45	21	15	4	..	1	9	6	1	4	13	2	76
Typhoid fever	12	5	2	2	2	3	4	4	5	3	2	3	9	5	12	7	20	12	15	10	11	7	5	5	99	66	38	59	6	2	8	20	5	3	8	7	9	165
Erysipelas	2	3	1	2	8	2	3	2	3	3	4	...	1	...	...	...	1	1	...	...	1	1	3	1	27	15	7	14	..	1	..	4	1	4	2	4	5	42
Puerperal fever	...	...	...	2	...	...	...	...	...	2	...	1	...	2	...	...	...	1	...	...	...	1	...	1	...	11	2	5	..	..	..	1	2	...	....	1	...	11
Carbuncle	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	2	...	...	1	..	..	..	....	...	1	....	..	...	2
Dysentery	1	1	...	...	...	...	...	...	1	2	1	...	2	3	4	7	1	4	...	3	...	...	...	1	10	21	6	15	1	..	1	....	...	...	4	..	4	31
Diarrhœa	...	1	1	1	3	...	1	1	2	1	2	2	9	4	14	10	2	10	2	...	...	2	1	...	37	32	13	16	..	..	1	5	3	2	7	11	11	69
Cholera morbus	...	...	...	...	...	...	...	...	...	...	...	...	2	1	2	6	2	3	...	...	...	...	...	...	6	10	2	9	..	..	..	1	...	...	3	..	1	16
Cholera infantum	...	2	1	...	...	1	1	...	1	...	3	2	62	68	52	39	22	13	6	3	4	...	...	...	152	128	76	57	3	1	5	21	13	18	30	38	18	280
Cerebro-spinal fever	2	3	1	5	10	6	6	2	11	5	3	2	5	2	3	...	3	2	4	2	5	1	1	4	54	34	19	18	2	1	1	4	10	2	12	13	6	88
Yellow fever	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

Rheumatism	...	...	...	1	1	4	1	...	2	1	...	...	...	1	...	...	...	2	...	1	. .	...	2	1	6	11	7	8	..	..	.	....	...	...	1	..	1	17
Pyæmia	1	...	...	...	...	...	2	...	1	...	...	. .	...	2	...	1	...	4	...	...	1	...	...	...	5	7	4	3	..	..	..	....	...	2	1	2	...	12
Syphilis, congenital	3	2	2	...	2	...	1	...	2	1	...	1	...	1	1	1	...	...	...	...	2	1	2	...	15	7	7	1	..	..	..	....	1	...	1	3	9	22
Syphilis, tertiary	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	1	...	...	...	1	1	...	...	1	3	2	2	2	..	..	..	....	...	...	..	..	1	5
Purpura	...	...	1	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	...	...	...	..	..	..	....	...	...	2	1	..	3
Alcoholism	5	3	3	1	2	...	3	4	5	2	4	2	5	3	3	1	5	3	6	1	2	1	3	1	46	22	8	35	4	3	..	2	...	...	2	1	13	68
Septicæmia	...	4	1	1	5	4	1	5	4	3	1	3	2	3	1	5	...	3	3	2	3	2	2	3	23	38	14	15	1	2	2	7	3	...	5	3	9	61
Remittent fever	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	..	..	..	....	...	...	....	..	...	1
Tonsillitis	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	1	1	...	..	..	..	....	...	...	....	..	...	1
Typhus fever	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	..	..	..	....	...	...	....	..	...	...
Influenza	17	12	4	6	5	1	1	2	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	27	22	13	11	1	1	2	3	...	2	3	2	11	49
Intermittent fever	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	1	...	...	..	..	1	....	...	...	....	..	...	1

Table IX.—Deaths from Principal Zymotic Diseases, arranged by Age and Sex.

	Und'r 1 yr.		1 yr. and under 2 yrs.		2 yrs. and under 3 yrs.		3 yrs. and under 4 yrs.		4 yrs. and under 5 yrs.		Total under 5 yrs.		5 yrs. and under 10 yrs.		10 yrs. and under 15 yrs.		15 yrs. and under 20 yrs.		20 yrs. and under 30 yrs.		30 yrs. and under 40 yrs.		40 yrs. and under 50 yrs.		50 yrs. and under 60 yrs.		60 yrs. and under 70 yrs.		70 yrs. and under 80 yrs.		80 yrs. and under 90 yrs.		90 yrs. and under 100 y's		Total of all ages.	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
Small-pox	...	...	...	1	...	...	1	...	...	...	1	1	...	...	...	...	...	...	...	...	1	1	...	...	1	...	...	...	...	...	...	...	...	...	3	2
Measles	3	3	6	6	3	3	...	2	...	1	12	15	2	...	...	...	...	...	...	1	2	1	...	...	...	...	...	...	...	...	...	...	...	...	16	17
Scarlatina	1	...	5	5	9	10	4	5	4	5	23	25	9	14	...	...	...	...	...	...	2	1	...	...	...	...	...	...	...	...	...	...	...	...	34	40
Diphtheria	10	6	21	23	27	27	21	21	12	16	91	93	32	44	4	4	2	...	2	1	1	1	...	...	2	...	...	...	...	...	...	...	...	...	134	143
Croup	3	1	3	5	3	1	4	1	2	...	15	8	2	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	17	10
Whooping-cough	22	25	7	14	1	4	...	2	1	...	31	45	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	31	45
Typhoid fever	1	...	...	...	1	...	...	...	...	...	2	...	3	1	5	6	7	10	37	18	28	19	9	8	5	4	2	...	1	...	...	...	...	...	99	66
Erysipelas	11	4	...	...	...	...	...	...	...	...	11	4	...	...	...	...	...	...	2	1	1	1	5	2	3	2	1	5	2	...	2	...	...	...	27	15
Puerperal fever	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	9	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	11
Carbuncle	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	1	...	...	...	...	...	2	...
Dysentery	3	...	1	1	...	1	...	...	...	...	4	2	1	...	...	...	...	...	1	1	...	...	...	2	...	1	3	5	1	7	...	2	...	1	10	21
Diarrhœa	20	18	6	...	...	...	...	...	...	...	26	18	...	...	...	...	...	...	1	2	1	1	...	1	...	1	3	3	4	3	2	3	...	...	37	32
Cholera morbus	1	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	1	...	2	2	...	...	1	1	3	2	2	...	1	...	...	6	10
Cholera infantum	131	106	17	16	3	4	...	1	...	...	151	127	1	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	152	128
Cerebro-spinal fever	9	7	3	5	6	2	3	2	3	1	24	17	4	5	4	2	4	4	8	2	3	1	5	2	...	...	2	1	...	...	...	...	...	...	54	34
Remittent fever	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

Rheumatism	...	1	...	...	...	...	...	1	...	...	...	2	...	...	...	...	...	...	1	...	...	...	2	...	1	5	1	2	...	2	1	...	...	...	6	11
Pyæmia	2	1	...	...	...	1	...	...	...	...	2	2	...	...	...	1	...	...	1	1	1	...	...	...	2	...	...	...	...	...	1	1	...	...	5	7
Syphilis, congenital	13	6	1	...	...	1	1	...	...	...	15	7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	15	7
Syphilis, tertiary	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	2	...	...	2	...	...	...	...	...	...	...	...	...	...	...	3	2
Purpura	2	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	...
Alcoholism	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	6	3	12	8	18	5	3	4	6	1	1	1	...	...	...	...	46	22
Septicæmia	3	2	1	1	...	1	...	...	...	...	4	4	2	2	...	1	...	1	2	10	3	7	3	7	6	4	3	1	...	1	...	...	...	...	23	38
Tonsillitis	...	1	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1
Typhus fever	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Influenza	4	2	...	...	...	...	...	1	...	...	4	3	1	...	...	...	2	...	2	...	2	...	3	...	4	3	3	5	4	6	2	5	...	...	27	22
Intermittent fever	...	1	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1
Yellow fever	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

Table X. — The Number and Percentages of Deaths in each Quarter of each Year during a Period of Thirty-five Years, 1865-1899, inclusive.

YEARS.	FIRST QUARTER.		SECOND QUARTER.		THIRD QUARTER.		FOURTH QUARTER.		Rate per 1,000 inhabitants.[1]
	Deaths.	Per cent.	Deaths.	Per cent.	Deaths.	Per cent.	Deaths.	Per cent.	
1865	1,115	24.55	1,068	23.52	1,353	29.80	1,005	22.13	23.61
1866	999	22.81	957	21.85	1,338	30.56	1,085	24.78	22.51
1867	1,071	24.22	950	21.49	1,191	26.94	1,209	27.35	22.38
1868	1,341	24.30	1,203	21.80	1,736	31.45	1,239	22.45	23.89
1869	1,374	24.88	1,297	23.48	1,562	28.28	1,290	23.36	23.54
1870	1,395	22.88	1,314	21.55	1,983	32.52	1,406	23.05	24.34
1871	1,411	23.97	1,299	22.06	1,842	31.28	1,336	22.69	22.82
1872	1,697	20.97	1,777	21.97	2,511	31.04	2,105	26.02	30.43
1873	2,115	26.88	1,726	21.93	2,278	28.95	1,750	22.24	28.75
1874	1,805	23.11	1,818	23.27	2,278	29.16	1,911	24.46	23.57
1875	2,190	24.17	2,011	22.20	2,680	29.58	2,179	24.05	26.50
1876	2,246	27.21	1,809	21.92	2,375	28.78	1,823	22.09	20.96
1877	1,723	23.55	1,613	22.05	2,317	31.67	1,663	22.73	20.89
1878	1,743	22.82	1,744	22.84	2,174	28.47	1,975	25.87	21.55

1879	1,947	26.32	1,615	21.83	1,959	26.48	1,877	25.37	20.63
1880	2,015	23.62	1,829	21.45	2,500	29.30	2,187	25.63	23.51
1881	2,332	25.86	2,021	22.42	2,466	27.35	2,197	24.38	24.48
1882	2,104	23.39	2,212	24.59	2,489	27.67	2,190	24.35	24.07
1883	2,268	23.28	2,409	24.74	2,757	28.31	2,306	23.67	25.69
1884	2,284	23.73	2,103	21.85	2,725	28.33	2,510	26.09	25.01
1885	2,510	26.10	2,484	25.82	2,592	26.95	2,032	21.13	24.64
1886	2,214	23.89	2,113	22.79	2,580	27.84	2,361	25.48	23.09
1887	2,362	23.45	2,281	22.65	2,912	28.90	2,518	25.00	21.41
1888	2,790	27.36	2,420	23.73	2,649	25.98	2,338	22.93	24.03
1889	2,437	23.75	2,543	24.79	2,854	27.82	2,425	23.64	23.52
1890	2,911	28.60	2,244	22.04	2,699	26.51	2,327	22.85	22.70
1891	2,442	23.10	2,540	24.03	2,835	26.82	2,754	26.05	23.09
1892	2,998	26.68	2,582	22.98	2,958	26.33	2,698	24.01	24.04
1893	2,969	25.35	2,847	24.31	3,013	25.74	2,881	24.60	24.55
1894	2,972	25.80	2,592	22.50	3,182	27.62	2,774	24.08	23.66
1895	2,995	26.44	2,574	22.72	3,027	26.72	2,733	24.12	22.60
1896	2,897	24.90	2,807	24.13	3,319	28.53	2,611	22.44	22.53
1897	3,022	27.09	2,802	25.12	2,833	25.40	2,497	22.39	21.08
1898	2,599	23.87	2,512	23.08	3,051	28.03	2,724	25.02	20.09
1899	2,987	26.75	2,632	23.57	2,800	25.07	2,748	24.61	20.12

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[1] Population estimated in non-census years on Dr. Farr's formula.

Table XI. — Deaths from Ten of the Principal Causes.

	Total Deaths from each Cause.	Percentage of each Cause to Total Mortality.	Death per 1,000 Inhabitants.	Total Deaths by Sex.		Total Deaths by Sex under Five Years.		Total Deaths under Five Years.	Percentage of each Cause under Five Years to Total Mortality.
				M.	F.	M.	F.		
Pneumonia..........	1,455	13.029	2.621	773	692	285	272	557	4.988
Phthisis pulmonalis,	1,236	11.068	2.227	659	577	23	18	41	.367
Heart disease.......	966	8.650	1.740	471	495	18	22	40	.358
Violent deaths......	620	5.552	1.117	457	163	41	22	63	.564
Apoplexy...........	428	3.833	.771	209	219	6	6	12	.107
Cancer..............	402	3.599	.720	125	277	....	1	1	.009
Bronchitis...........	393	3,519	.708	174	219	104	104	206	1.863
Marasmus, etc.......	328	2.937	.591	175	153	161	137	298	2.668
Nephritis............	298	2.668	.537	162	136	8	7	15	.134
Meningitis..........	281	2.516	.506	161	120	122	90	212	1.890

Table XII. — Total Deaths each Quarter of the last Five Years, with the Aggregate and Average Number from 1890 to 1894, inclusive.

	1895.	1896.	1897.	1898.	1899.	5 years, 1890-1894.	
						Aggregate.	Average.
First quarter........	2,995	2,897	3,022	2,599	2,987	14,292	2,858
Second quarter......	2,574	2,807	2,802	2,512	2,632	12,805	2,561
Third quarter.......	3,027	3,319	2,833	3,051	2,800	14,687	2,937
Fourth quarter......	2,733	2,611	2,497	2,724	2,748	13,434	2,687
Total each year..	11,329	11,634	11,154	10,886	11,167	55,218	11,043

Table XIII. — Total Deaths and Percentages each Quarter for the year 1899, with Aggregates and Percentages for the Ten Years Previous.

	1899.		1889-1898.	
	Deaths.	Per cent.	Deaths.	Per cent.
First quarter..........................	2,987	26.75	27,242	24.65
Second quarter........................	2,632	23.57	27,043	24.48
Third quarter..........................	2,800	25.07	29,771	26.95
Fourth quarter.........................	2,748	24.61	26,424	23.92
Total..............................	11,167	100.00	110.480	100.00

Table XIV. — Parentage of Children under One, Two, and Five Years for each Month during Year 1899.

	JANUARY.			FEBRUARY.			MARCH.			APRIL.			MAY.			JUNE.		
	Under 1 yr.	1 yr. and under 2 yrs.	2 yrs. and under 5 yrs.	Under 1 yr.	1 yr. and under 2 yrs.	2 yrs. and under 5 yrs.	Under 1 yr.	1 yr. and under 2 yrs.	2 yrs. and under 5 yrs.	Under 1 yr.	1 yr. and under 2 yrs.	2 yrs. and under 5 yrs.	Under 1 yr.	1 yr. and under 2 yrs.	2 yrs. and under 5 yrs.	Under 1 yr.	1 yr. and under 2 yrs.	2 yrs. and under 5 yrs.
United States	57	14	16	42	14	10	51	11	6	29	10	12	35	9	8	36	11	9
Foreign	86	25	32	83	35	21	78	38	29	79	42	32	74	24	25	55	33	26
Mixed	25	12	7	23	8	8	28	10	9	32	6	9	23	9	8	22	6	7
One parent known	17	1	......	4	1	1	10	2	2	12	5	......	13	......	5	21	2	......
Unknown	5	......	......	2	......	1	4	3	1	......	......	3	4	......	1	13	......	......
Total	190	52	55	154	58	41	171	64	47	152	63	56	149	42	47	147	52	42

	JULY.			AUGUST.			SEPTEMBER.			OCTOBER.			NOVEMBER.			DECEMBER.		
	Under 1 yr.	1 yr. and under 2 yrs.	2 yrs. and under 5 yrs.	Under 1 yr.	1 yr. and under 2 yrs.	2 yrs. and under 5 yrs.	Under 1 yr.	1 yr. and under 2 yrs.	2 yrs. and under 5 yrs.	Under 1 yr.	1 yr. and under 2 yrs.	2 yrs. and under 5 yrs.	Under 1 yr.	1 yr. and under 2 yrs.	2 yrs. and under 5 yrs.	Under 1 yr.	1 yr. and under 2 yrs.	2 yrs. and under 5 yrs.
United States	88	10	6	86	16	7	50	10	12	36	4	15	37	17	9	43	12	10
Foreign	156	35	28	154	23	19	112	31	24	93	19	25	95	15	25	104	33	37
Mixed	46	10	12	49	12	7	48	13	3	17	6	7	33	9	6	37	6	10
One parent known	31	3	2	37	1	......	14	......	......	11	......	......	9	......	1	11	4	......
Unknown	13	1	1	11	1	1	4	2	3	7	......	......	5	2	......	4	2	1
Total	334	59	49	337	53	34	228	56	42	164	29	47	179	43	41	199	57	58

Table XV.—Cases Reported, and Deaths from Small-pox, Diphtheria, Scarlet Fever, and Typhoid Fever, with Percentages.

DATE.	SMALL-POX.		Percentages.	DIPHTHERIA.		Percentages.	SCARLET FEVER.		Percentages.	TYPHOID FEVER.		Percentages.
	Cases.	Deaths.		Cases.	Deaths.		Cases.	Deaths.		Cases.	Deaths.	
1872	2,592	738	28.4									
1873	1,103	302	27.3									
1874	7	2	28.5									
1875	5	1	20.0									
1876	6	2	33.33									
1877	17	4	23.5	....	....	....	1,334	104	7.7			
1878	....	....	....	1,370	448	32.7	848	68	8.0			
1879	....	....	....	1,167	391	33.5	951	149	16.6			
1880	4	1	25.0	1,715	588	34.2	497	33	6.6	Oct. 1 to Dec. 31.	Oct. 1 to Dec. 31.	
1881	44	6	13.6	1,680	601	35.7	383	35	9.1	335	76	26.8
1882	24	8	33.3	1,386	458	33.04	689	75	10.8	808	212	26.2
1883	8	1	12.4	1,415	444	31.4	1,408	211	14.9	887	198	22.3
1884	1	1	100.0	1,212	345	28.46	2,526	209	8.2	948	216	22.6
1885	11	1	9.0	1,263	334	26.44	1,665	156	9.2	767	152	19.8
1886	1	....	....	1,188	329	27.69	1,149	81	7.0	814	135	16.5
1887	4	....	....	1,049	316	30.12	1,549	195	12.58	940	183	19.46
1888	8	1	12.4	1,411	470	33.30	707	65	9.19	924	170	18.39
1889	10	2	20.0	1,814	564	31.09	464	23	4.96	1,071	186	17.37
1890	1	....	....	1,475	401	27.18	924	42	4.54	847	135	18.29
1891	....	....	....	831	232	27.91	1,327	64	4.82	966	154	15.94
1892	....	....	....	1,353	414	30.59	2,938	262	8.91	765	137	17.90
1893	26	4	15.3	1,465	476	32.49	2,580	248	9.61	824	148	17.96
1894	77	22	28.5	3,019	817	27.06	2,230	192	8.60	915	141	15.41
1895	....	....	....	4,059	588	14.48	1,612	114	7.07	1,026	163	15.88
1896	....	....	....	4,489	516	11.49	1,216	121	9.95	1,076	162	15.06
1897	10	....	....	3,398	411	12.09	1,938	136	7.02	609	173	28.40
1898	....	....	....	1,661	170	10.23	877	33	3.76	555	185	33.33
1899	*29	5	17.24	2,836	277	9.76	1,381	74	5.36	765	165	21.57

* Including one case and one death at quarantine.

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Table XVII.[1] — Diseases Arranged Alphabetically.

Abortion (criminal)	4
Abscess (unclassified)	14
“ of brain	3
“ of liver	10
“ of lung	2
Accidents (unclassified)	120
“ burns and scalds	56
“ drowned	54
“ elevator	17
“ electric shock	4
“ fall	34
“ fracture of neck	5
“ “ of thigh	13
“ “ of skull	34
“ “ of spine	6
“ overlaid	3
“ poisoning	8
“ poisoning by illuminating gas (suicides included)	48
“ railroad	66
“ suffocation	8
Alcoholism	68
Anæmia	14
“ pernicious	33
Aneurism, not located	3
“ aorta	11
Angina pectoris	21
Anus, imperforate	3
Appendicitis	50
Apoplexy	428
Arterio sclerosis	52
Asthenia	4
Asthma	7
Atelectasis pulmonum	10
Asphyxia of new-born	11
Brain, disease of (unclassified)	13
“ abscess of	3
“ congestion of	7
“ embolism of	9
“ inflammation of	10
“ softening of	24
“ tumor of	26

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[1] This table does not include the total number of deaths.

Bronchitis (unclassified)	228
“ acute	38
“ chronic	60
“ capillary	67
Cancer (unclassified)	78
“ of abdomen	8
“ of bladder	8
“ of bowels	24
“ of breast	39
“ of face	7
“ of heart	9
“ of kidney	2
“ of liver	40
“ of neck	9
“ of œsophagus	1
“ of ovaries	2
“ of pancreas	14
“ of rectum	13
“ of stomach	78
“ of throat	12
“ of tongue	2
“ of uterus	56
Cholera infantum	280
“ morbus	16
Cellulitis	4
Cirrhosis of kidney	5
“ of liver	64
Convulsions	59
Croup	27
Cystitis	27
Cyanosis	11
Debility	6
Diabetes	28
“ mellitus	30
Diarrhœa	69
Diphtheria	277
Dysentery	31
Embolism (unclassified)	6
“ of brain	9
“ of heart	4
“ of lungs	3
Emphysema	4
Empyema	8
Enteritis	42
Entero-colitis	70
Epilepsy	9
Erysipelas	42

Extra-uterine pregnancy	4
Fever, puerperal	11
“ scarlet	74
“ typhoid	165
Gangrene	16
Gastro enteritis	221
Goitre (exophthalmic)	1
Heart disease (unclassified)	510
“ cancer of	9
“ dilatation of	33
“ embolism of	4
“ endocarditis	57
Heart, fatty degeneration of	28
“ hypertrophy of	7
“ malformation of	24
“ pericarditis	13
“ valvular	281
Heat stroke	5
Hemophilia	3
Hernia, strangulated	15
Hydrocephalus and tubercular meningitis	157
Homicide	15
Inanition	191
Insanity	20
Jaundice	3
Kidney diseases (unclassified)	5
“ Bright's disease of	118
“ cancer of	2
“ cirrhosis	5
“ inflammation of	298
Laryngitis	2
Leucocythæmia	3
Liver diseases (unclassified)	11
“ abscess of	10
“ cancer of	40
“ cirrhosis of	64
“ inflammation of	9
Locomotor ataxia	11
Lung diseases (unclassified)	1
“ abscess of	2
“ congestion of	7
“ œdema of	2
“ consumption of	1,236
“ embolism of	3
“ inflammation of	1,455
Malformation of heart	24
Measles	33

Meningitis	281
" cerebro-spinal	88
Obstruction of bowels	44
Old age	212
Ovarian cancer	2
" tumor	5
Paralysis	72
Prostate gland (disease of)	15
Peritonitis	105
Pleurisy	23
Pneumonia (unclassified)	1,139
" broncho	308
" pleuro	8
Poisoning (accidental)	8
Premature birth	207
Puerperal diseases, not including puerperal fever	44
Pyæmia	12
Rheumatism	17
Scrofula	6
Septicæmia	61
Sarcoma	11
Spinal disease (unclassified)	9
" " Pott's	4
" inflammation	10
Spina bifida	7
Stomach, inflammation of	41
" ulceration of	18
Suffocation (accidental)	8
Suicide	102
Surgical operation (death following)	26
Syphilis	22
" congenital	5
Tabes-mesenterica, and marasmus	322
Teething	9
Tetanus	7
Tuberculosis	177
Tumor (unclassified)	10
" of abdomen	5
" of brain	26
" of ovary	5
" of uterus	3
Uterine disease, cancer	56
" " tumor	3
Umbilical hæmorrhage	3
Uræmia	13
Whooping-cough	76

CHOLERA INFANTUM.

Comparison of Deaths from Cholera Infantum for Three Months of each Year during a Period of Twenty-nine Years, with Temperature and Humidity, also Percentages to the Total Mortality.

	CHOLERA INFANTUM.					TEMPERATURE.											
						June.				July.				August.			
	June.	July.	August.	Total Deaths.	Percentage to Total Mortality.	Highest Temp.	Lowest Temp.	Mean Temp.	Mean Humidity.	Highest Temp.	Lowest Temp.	Mean Temp.	Mean Humidity.	Highest Temp.	Lowest Temp.	Mean Temp.	Mean Humidity.
1871.........	20	245	160	425	7.21	91.	50.	55.9	57.2	92.	57.	70.8	59.2	89.	55.	71.2	71.2
1872.........	26	327	231	584	7.21	93.5	47.	58.2	71.3	98.5	55.	74.7	67.6	95.	50.	72.4	75.5
1873.........	19	168	263	450	5.71	93.	47.	67.8	59.2	96.	55.	73.	69.4	96.	50.	68.9	69.4
1874.........	12	152	276	440	5.63	98.	49.	66.1	69.1	94.	46.	72.8	69.9	91.	51.	58.1	70.
1875.........	13	215	268	496	5.47	94.	46.	66.7	64.	93.	54.	71.4	68.1	87.	54.	70.2	75.7
1876.........	18	220	198	436	5.28	90.	44.	58.1	74.5	96.	52.	73.8	69.4	96.	50.	59.9	68.2
1877.........	14	206	180	400	5.46	92.	47.	66.9	56.8	91.	57.	70.1	75.9	92.	58.	71.	78.5
1878.........	6	135	154	295	3.73	92.	45.	64.1	57.	98.	54.	72.9	67.1	87.	53.	67.8	68.3
1879.........	3	102	175	280	3.78	96.	45.	64.1	70.4	94.	50.	70.	68.8	95.	52.	68.1	72.7
1880.........	24	179	182	385	4.51	93.	48.	67.3	67.4	101.	52.	70.1	73.2	96.	47.	68.9	72.6
1881.........	....	104	196	300	3.32	86.	44.	60.6	70.	89.	54.	68.5	73.1	97.	58.	69.5	74.
1882.........	11	187	197	395	4.39	94.	48.	65.9	63.8	98.	52.	71.7	65.1	92.	51.	70.	66.
1883.........	23	228	199	450	4.62	90.5	51.	69.	72.9	96.	51.4	71.1	71.7	91.8	48.	67.6	66.8
1884.........	11	158	179	348	3.61	92.6	42.	66.	74.5	90.3	58.6	68.	75.5	94.3	51.	68.2	84.5
1885.........	16	226	135	377	3.91	91.9	45.3	66.4	62.	92.8	51.4	71.3	69.8	88.8	47.2	67.4	76.
1886.........	5	170	151	326	3.51	81.7	50.3	63.1	70.6	95.4	54.5	70.8	69.8	90.4	49.3	67.7	71.7
1887........	6	223	175	414	4.10	89.	47.5	64.5	71.7	95.	61.	73.	77.	86.3	52.2	67.1	74.2
1888.........	6	130	192	328	3.21	96.	49.	68.4	68.	88.	51.	68.3	68.06	88.2	52.	69.	70.7
1889.........	28	200	124	352	3.43	87.	50.	67.7	79.3	86.	55.	69.	82.2	84.	52.	67.4	78.6
1890.........	5	178	206	389	3.82	87.	50.	64.2	67.	95.	52.	71.	67.	89.	50.	68.9	75.6
1891.........	23	236	206	465	4.39	96.	45.	65.	70.8	90.	56.	69.	72.	90.	54.	70.	78.
1892.........	16	269	196	481	4.28	96.	49.	70.	70.	96.	54.	73.	63.	94.	55.	70.	77.
1893.........	8	156	177	341	2.91	94.	52.	65.	83.	91.	54.	71.4	68.2	93.	53.	69.6	59.4
1894.........	13	251	160	424	3.68	95.	47.	69.	70.	97.	56.	73.7	62.6	90.	47.	68.	73.
1895.........	8	127	182	317	2.79	96.	50.	67.	74.9	85.	54.	69.	72.	89.	50.	70.9	69.
1896.........	18	315	177	510	4.38	92.	49.	66.	70.	93.	57.	72.	74.	95.	52.	71.	74.
1897.........	7	134	162	303	2.71	87.	47.	62.	71.	94.	55.	71.6	81.	86.	53.	70.	77.
1898.........	6	73	225	304	2.79	92.	50.	66.	76.	99.	55.	72.	75.	94.	55.	73.	77.
1899.........	5	130	91	226	2.02	93.	52.	70.	63.2	94.	55.	72.6	67.	90.	53.	68.8	75.

DISINFECTION.

The work of disinfection has been continued with the following results:

Diphtheria		2,672
Scarlet fever		1,193
Measles		124
Phthisis		169
Small-pox		34
Chicken-pox		7
Cancer		11
Typhoid fever		9
Glanders		197
Infected bedding, etc.	Lots	103
" books, etc.	"	215
" clothing, etc.	"	112
" carriages		27
" schools		31
Total		4,904

Formaldehyde used	1,933	galls.
Alcohol "	875	"
Chloride of lime "	57,462	lbs.
Bi-chloride of mercury used	625	"
Muriatic acid (in mixing)	35	galls.
Salt "	350	lbs.
Rooms disinfected	8,976	

A. A. DOWNS,

Superintendent Disinfecting Corps.

	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
Streets..........	....	....	9	13	21	33	74	81	69	21	11	1	333
Places...........	....	...	17	39	64	147	296	289	174	74	29	8	1,137
Courts...........	....	....	15	21	71	201	343	302	143	67	14	7	1,184
Alleys	....	....	27	167	207	534	987	873	821	424	51	22	4,113
Passageways...	....	11	42	595	472	956	1,026	1,233	1,141	725	101	34	6,336
Yards	....	17	374	648	931	1,735	3,463	3,718	3,347	962	211	93	15,599
Vaults	7	18	19	31	95	101	226	273	231	91	23	11	1,126
Cellars..........	39	41	193	463	981	1,375	1,607	1,529	1,632	973	343	101	9,276
Gutters	....	....	13	178	203	568	1,086	1,426	1,557	516	211	23	5,781
Water-closets...	71	109	378	491	651	1,194	1,448	1,351	1,514	961	523	165	8,856
Urinals.........	11	16	21	39	47	51	162	159	137	62	39	21	765
Vacant lots.....	....	....	8	22	47	82	207	227	235	62	11	2	898
Filthy-rooms....	261	291	230	312	418	421	215	271	251	326	368	379	3,943
Filthy sheds....	9	13	67	419	592	736	1,258	1,324	1,117	663	332	67	6,597
Sinks...........	124	191	251	789	917	1,248	2,147	2,347	2,458	1,491	716	509	13,137
Cesspools.......	...	....	41	659	737	1,493	2,235	3,371	3,594	1,942	213	51	14,336
Total.........	522	607	1,710	4,836	6,464	11,175	16,778	20,749	18,401	9,360	3,195	1,494	95,291

The following table shows the work of abatement of nuisances by inspection, and notice from the office:

Table showing Number of Nuisances Abated.

	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
House drains repaired..	479	292	315	254	188	263	270	284	239	309	253	221	3,367
Vaults cleaned and repaired................	13	5	6	17	16	14	28	43	13	21	14	7	197
Traps supplied	142	82	108	100	92	94	96	100	128	131	123	71	1,262
Yards cleaned	117	30	124	459	322	309	235	187	98	123	80	82	2,166
Cellars cleaned	212	128	151	171	141	178	256	242	112	136	94	89	1,910
Cesspools cleaned	25	9	34	58	30	42	102	63	44	52	37	30	526
Water-closets cleaned and repaired..........	785	523	508	335	348	335	320	375	248	349	228	246	4,595
No. of places from which fowls were removed..	8	1	13	11	14	22	12	15	2	5	9	11	123
Supply pipes repaired..	34	48	18	19	25	27	15	28	22	18	13	13	280
Privies cleaned and repaired...............	.....	.....	.....	.....	1	2	11	.....	.....	.....	.....	....	14
General want of cleanliness and repairs	102	60	69	48	54	68	70	82	50	41	35	32	711
Exposed manure	1	.....	3	4	11	20	8	4	5	2	2	2	62
Passageways cleaned...	22	9	25	153	164	214	140	90	82	43	42	33	967
Sheds cleaned...........	4	3	20	8	15	39	16	12	10	4	8	4	143
Tenements whitewashed	158	52	121	124	211	125	80	73	38	31	16	13	992
Stables cleaned	2	1	1	7	12	8	11	6	2	7	1	4	62
Sundry nuisances	13	13	41	27	35	73	104	52	26	19	16	36	455
Rain conductors repaired................	5	1	10	8	5	4	8	17	17	17	11	9	112
Roofs repaired..........	9	12	20	8	4	20	14	14	9	13	2	3	128
Receptacles provided for garbage...........	3	.....	3	13	7	17	32	18	8	14	13	9	137
Places from which swine were removed.........	1	.....	1	.....	.....	.....	.....	2	.....	.....	.....	....	4
Stagnant water removed from vacant lots	.....	1	4	17	11	6	4	1	4	10	5	1	64
Vacant lots cleaned.....	2	.....	3	17	33	49	23	8	8	9	7	6	165
Houses cleaned of dead rats	1	.....	2	1	1	.....	1	1	.....	.....	1	1	9
Overcrowded rooms	2	.....	1	1	1	2	.....	.....	.....	1	1	....	9
Places from which goats were removed.........	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	....	1
Gas pipes repairs.......	15	27	9	4	6	4	2	1	1	2	3	6	80
Total	2,155	1,297	1,600	1,864	1,747	1,935	1,808	1,718	1,116	1,358	1,014	929	18,541

QUARANTINE REGULATION.

Owing to the breaking out of yellow fever at Hampton, Va., the following orders were added temporarily to our quarantine regulations, and on cessation of the fever the order was rescinded:

August 2, 1899.

Until further orders all vessels arriving at this port from any port in Virginia or the Chesapeake bay, shall first stop at quarantine for examination, and no such vessel, or any person on board of such vessel, shall proceed to the city until authorized to do so by the Port Physician.

August 11, 1899.

It was voted that the order passed by this Board on the 2d inst., quarantining all vessels arriving at this port from any port in Virginia or the Chesapeake bay, be rescinded, to take effect the 12th inst.

DEPOSIT OF SPUTUM.

October 13, 1896.

The regulation of the Board of Health against spitting on the floors of the street cars having brought about a marked improvement in the sanitary condition and safety of the street cars, it was thought advisable to extend the scope of this order to cover several other places where the need for it was also great. The order was therefore amended and issued as follows:

BOSTON, March 23, 1899.

At a meeting of the Board of Health, this day, the regulation dated October 13, 1896, respecting the deposit of sputum in street cars, was amended so as to read as follows:

"The Board of Health hereby adjudges that the deposit of sputum in public places is a nuisance, source of filth and cause of sickness, and hereby orders: That spitting upon the floor, platform, or steps of any railroad or railway station, car, public building, hall, church, theatre, market, or any sidewalk immediately connected with said public places, be, and hereby is, prohibited."

There can be no doubt as to the general public approval of this step for the suppression of one of the most common, vulgar, and uncleanly public habits. The surprisingly general compliance with this order without legal interference is good evidence of its popularity. The enforcement of the order rests with the police and other custodians of the several public places which are affected by the orders. Prosecutions have as yet rarely been resorted to.

ALLEYWAYS.

The following alleyways have been selected during the past year as sufficiently bad to require paving and draining under the Special Act of the Legislature of 1898, and we have so certified them to the Board of Street Commissioners:

Passageway from 237 Northampton to 230 Camden street.
Northampton place.
Passageway leading from 1 Northampton place.
Passageway leading from 174 Northampton to 51 Camden street.
McLean court.
Passageway from Windsor place, between Hammond and Windsor streets.
Passageway rear 9–11 and 13 Windsor street.
Passageway from 139 North street to 58 Fulton street.

The Board of Health regrets to find that the Act referred to, and as interpreted by the Corporation Counsel, does not authorize the paving of certain alleyways, as indicated by the following letter from the Board of Street Commissioners:

CITY OF BOSTON,
STREET COMMISSIONERS OFFICE,
CITY HALL, BOSTON, July 25, 1899.

To the Board of Health:

GENTLEMEN, — The Street Commissioners do not understand that under the statute for the laying out of public alleys — chapter 298 of the Acts of 1898 — the city is authorized to take other care of them than that mentioned in section 2 of the Act, — "to keep the same free from any substance which is liable to cause sickness or a nuisance." The Street Commissioners understand the Act to apply to what are commonly called "back alleys," and that any small streets or passageways with houses fronting upon them are not to be considered within the scope of this Act. The objection to the laying out of these small streets or alleys with places of residence upon them is found in the fact that they lose their designation as streets, places, courts, etc., and become known simply as "public alleys." This has kept the Commissioners from laying out anything but back passageways leading to rear of estates. The first section of the Act also limits the widths of any passage to be laid out under this authority to twenty-five feet.

Of the list of passages submitted in your letter those coming within the description of small ways or streets upon which there are apparently houses, stables, or places of business located and numbered are:

Draper's lane,
Asylum street,
Stillman place,
Crescent place,
Ivanhoe street,
Thatcher court,
Powers' court.

The passages in the list seeming to the Street Commissioners to come within the intention of the Act are:

The alley from Stoddard street,
Crab alley,
Cotton lane,
Cambridge-street avenue,
Medford court.

The passageway mentioned in the rear of 685 to 703 Tremont street is probably within the class intended, but its relation to the grade of West Newton street and Rutland square might be an obstacle to its acceptance, that is if it is approached by steps at both, or either, ends. The alleyway, called Hancock row, from Marshall street to Creek square, has been made public under the designation of Public Alley No. 102 in District No. 2.

Respectfully,
(Signed) J. H. JENKINS,
Secretary.

ROXBURY CANAL.

The remaining portion of the old Roxbury canal extends from Swett street and in the rear of Albany street to South bay. It is navigable for small vessels, and is appurtenant to several lumber wharves, and receives the storm overflow from the Albany-street sewer. It constitutes a long pocket into which foul matters are lodged without any means of flushing. The bottom of the canal is a bed of pulpy filth several feet in depth, which is partly exposed at low tide, and can be removed only by dredging. The canal is a nuisance at all times of the tide and at all seasons of the year, although it is much worse in summer and at low tide. There can be no doubt about the sickening and damaging effect of this foul odor upon the inmates of the several departments of the City Hospital and upon the whole neighborhood.

This is a matter which ought to receive immediate attention on the part of the city and the abutters who have interests in the use of the canal and in the cause of its pollution.

STONY BROOK AND BACK BAY FENS.

Stony brook passes through a series of populated sections from the Dedham line through Forest Hills, Jamaica Plain, Roxbury, and Back Bay to the Charles river. It is the natural receptacle for a great variety of cast-off and waste matter, and from its low grade receives sewage matter from drains and overflowing cesspools along its course where sewers are not available. Much of this polluted water has flowed into the comparatively quiet water basins of the Back Bay fens where it has at times been quite offensive.

Complaints by the people along the borders of the brook and fens have been made for many years, but more so during the year of 1899 when, owing to the small amount of rain, the brook ran very low, and exposed more filth than usual, which it was unable to carry away.

The Board of Health, being powerless to give the needed relief, requested a conference of the interested departments by the following letter addressed to the Mayor:

HEALTH DEPARTMENT, OLD COURT HOUSE,
BOSTON, July 6, 1899.

HON. JOSIAH QUINCY,
Mayor of the City of Boston:

DEAR SIR, — For many years a nuisance has existed to a greater or less extent in the summer season in the Stony brook, between Jewett street, Ward 23, and Huntington avenue, Ward 22. Between these two points seventy-five houses and factories discharge their sewage directly into the brook. This sewage, added to a variety of other filth, incidental to a stream running through a thickly populated district, makes the brook so foul as to be a serious menace to the health and comfort of all who live or do business along its borders. The lack of rain for flushing purposes has made the present season one of the worst in the history of the brook.

On reaching Huntington avenue this stream discharges into the deep and sluggish basins of the water of the Back Bay fens, where the foul matter is deposited and remains to annoy all who live or travel about the Fenway. The remedy for this evil is, undoubtedly, to be found in diverting all the sewage from the brook into the public sewers, or by closing all dwellings and factories which now drain into the brook. The city departments find grave difficulties in the former method, and severe hardships to citizens in the latter. The waters in the Fenway might be relieved by diverting the foul brook elsewhere, as has been proposed by good engineering skill, but this would not relieve the serious condition of the brook above the Fenway.

In view of the magnitude and importance of this question the Board of Health respectfully suggests that the Mayor call in conference the several departments interested in this question, including the Street, Engineers and Health Departments, to discuss and devise a proper plan for an immediate and permanent remedy for the evil complained of. The Board of Health would further recommend that if the suggestion meet with the Mayor's approval the conference be held as early as possible.

Very respectfully,
THE BOARD OF HEALTH,
SAMUEL H. DURGIN,
Chairman.

The time was set and a conference held in the Mayor's office, when it was stated that the flow of polluted water from the brook into the Back Bay fens had been stopped for several weeks, that plans were being considered for the relief of both brook and basins, and it was agreed that the brook should be flushed at once with city water for temporary relief.

The conditions along the borders of Stony brook are such as to make its pollution inevitable, and the conditions of the water beds of the Back Bay Fens (low grade and lack of efficient means for flushing) are such that foul matter turned into them becomes cumulative, troublesome and expensive to remove.

The remedy seems a simple one to suggest; namely, that the brook, which must exist, should be protected by public sewers, and the Back Bay Fens basins should be flushed and served with clean water only. But for practical and reasonable ways and means the Engineer and Treasurer must be consulted.

The Board of Health respectfully urges that the necessary plans be provided and put into execution as soon as the Mayor and City Council shall find it reasonable.

THE GARBAGE PLANT.

The garbage plant adjoining the pumping-station in Cow Pasture, Dorchester District, has been the subject of much serious complaint from the people of Dorchester and South Boston during the greater part of the year, and these complaints and the causes thereof were carefully investigated by the Board of Health after having given due hearing to the complainants. As a result of these proceedings the following communication was sent to the Superintendent of Streets, through His Honor the Mayor, in August last. This communication, which is herewith submitted, contains a full summary with respect thereto:

August 25, 1899.

BENJ. W. WELLS, ESQ.,
Superintendent of Streets:

DEAR SIR,— The Board of Health respectfully calls your attention to the following facts concerning the garbage plant adjoining the pumping-station at Cow Pasture, Dorchester District, and recommends such immediate action on your part as the terms of the contract between the City of Boston and the New England Sanitary Product Company, seem to demand.

This garbage plant was installed and called into use November 15, 1898. Complaints of offensive odors from said plant began to be made early in the present summer. The Board of Health made a thorough investigation, and found that offensive odors from this garbage plant were reaching distances of over one mile, and that the complaints from the residents of Dorchester and elsewhere were well founded. Hearings were given by the Board of Health to the complainants and to the officers of the New England Sanitary Product Company in June and July. Promises were made to the Board of Health by the officers of the said company so to alter and repair the plant as to do away with any nuisance and that such repairs and alterations would be completed on or before August 1, 1899. This time was granted as requested, and the officers of the company reported the work completed about the first of August.

Notwithstanding these alterations in the plant and the assurances of its management that its condition was then such as to control the odors the complaints of the residents of Dorchester and elsewhere have continued with increasing frequency and force down to the present date. The Board of Health has diligently traversed the territory within the range of the odors complained of, by day and by night, with a view of estimating the degree of nuisance and with an earnest hope that the alterations in the plant would be found to have been successful in so far diminishing the nuisance as to make the plant tolerable to the people living in the vicinity.

The Board of Health now, however, feels bound by its convictions and obligations to report to you that the said garbage plant at Cow Pasture has been, for several months and is now, causing such offensive odors to the inhabitants of Dorchester, South Boston, and elsewhere, as to warrant it in declaring said plant to be "objectionable to the public health or comfort" within the meaning of the terms of the contract between the City of Boston and the New England Sanitary Product Company, and to request immediate action on the part of yourself under the following terms of the said contract:

(Art. 3, Sect. E.) "Carry on all said work in such manner that the appearance, smell, and use of said scows and their loads and the appearance, smell, and operation of said plant and the taking of any substances, materials, residues, or waste to or from said island, and the depositing or keeping any thereof in any place, will not be objectionable to the public health or comfort.

(Art. 9.). "If the contractor from any cause, except fire or extraordinary ice in the water surrounding the city or in Boston Harbor, or process of law, or other extraordinary or unavoidable cause as aforesaid, shall fail for more than five successive days to remove, or to cremate or render, said garbage as required in this contract, or to dispose of the residue or waste thereof as so required, the superintendent acting for the city, by notice in writing to that effect, signed by him and approved by the Board of Health of said city and the Mayor, given to the contractor or mailed to him at the business address given by him to the superintendent, may cancel this contract, or using any labor, materials, implements, or machinery of the contractor with any others he may deem necessary, and by day labor, contract, or otherwise, without further notice, may take possession of the plant and any scows of the contractor he may desire, forcibly if necessary, and thereafter do the things required in this contract of the contractor; and in case that such cancellation, or the taking possesion of the property and doing things as aforesaid any expenses, losses or damages incurred by the city in each and every month of said term of ten years in removing and disposing of the garbage, to be removed by the contractor under this contract, over and above the amount which would have been paid to the contractor by this contract, shall be paid to the city by the contractor.

Very respectfully,
THE BOARD OF HEALTH,
SAMUEL H. DURGIN,
Chairman."

This action was decided upon by the Board of Health as being the one evidently contemplated and provided for in the contract between the city and the company. In this action the Board of Health sought not only to perform its evident duty to the complainants, but to place the Mayor and the Superintendent of Streets in possession of all the facts necessary for their action as provided for in the contract.

After this communication had been sent complaints continued to be made by the residents of Dorchester and South Boston, and, notwithstanding the claim on the part of the managers of the plant that successful alterations were constantly being made, the complaints continued to come to the Health Department until late in the season, when windows are kept closed and the atmospheric conditions generally lessen the severity of nuisances of this character. During the winter months there have been occasional complaints, but hardly of a sufficiently serious character to warrant action on the part of this Board.

Meanwhile the plant continues in operation, and it remains to be seen what developments the warm season will bring.

REMOVAL OF OLD BUILDINGS.

The work of removing buildings and parts of buildings which have become, by reason of age or other cause, unfit for further occupancy or repairs, or by reason of injury to other property, has been pursued as in previous years upon the personal examination and judgment of the Board of Health.

Ninety-two have been ordered down, 59 have been removed, 11 remain under order for removal, and in 13 instances the order has been withdrawn to allow unusual and satisfactory repairs.

No litigation or other difficulties have arisen in the settlement of damages.

PUBLIC SCHOOL-HOUSES.

There has been during the past year fully as many complaints as usual concerning defective drainage, want of ventilation, and other causes of discomfort or unhealthfulness in our school-houses. Inspections are always made on complaint, and the results communicated to the School Committee. A general examination of all public school-houses in the city has been asked for by the School Committee recently, and this work is now being done, and will be reported later.

A few special cases have been reported during the year, as follows:

Honorable School Committee:

GENTLEMEN, — Complaint having been made at this office of offensive odors in basement of the Brighton High School building, the Board of Health has made personal examination, and finds that the washout under the girls' closets is in bad condition, and is the cause of a nuisance of the most unpleasant character, and which ought to be corrected without delay. The Board would suggest that the situation of these closets makes it practically impossible to utilize a washout as a means of flushing, without annoyance through the fresh-air shafts, and otherwise to the whole building; it does, therefore, respectfully suggest that the individual short hopper, with local vent for each and an extension of the drain for about twenty-five feet, will be the most serviceable, satisfactory, and, in time, the most economical means of correcting the evil.

Yours very respectfully,
THE BOARD OF HEALTH,
SAMUEL H. DURGIN,
Chairman.

HEALTH DEPARTMENT, OLD COURT HOUSE,
BOSTON, March 16, 1899.

To the Common Council, City of Boston:

GENTLEMEN,— In response to your order of the 2d inst., concerning the Brighton High and William Wirt Warren school-houses in Brighton, the Board of Health respectfully reports that, on examination the latter house is found to have defective drainage in its basement at the foot of the soil-pipe near the sink on the boys' side; also in that part of the basement where the urinal is located. All the fixtures are trapped and ventilated. The latrines are located in basement, and were found to be in a fair condition. At the time of the examination a slight odor was noticeable from the urinal in the basement. The ventilating apparatus connected with the school appeared at the time of this inspection to be in good working order. The fresh-air shaft, however, passes through the basement and rooms in which the privy and urinal accommodations are located, and when its valves are open the air-shafts receive air from the basement rooms, which ought not to be permitted.

The Brighton High School-house was examined on complaint the latter part of January, 1899, and a report of its condition and needs was made to the School Committee, a copy of which we enclose herewith.

The only addition we would make to the enclosed report to the School Committee is that the same alterations from the Mott washout to the single and ventilated water-closets be made on the boys' side as was recommended for the girls' closets and for the same reasons.

An estimate of the expense of such repairs and alterations might better be obtained from the Building Department.

Very respectfully,
The Board of Health,
Samuel H. Durgin,
Chairman.

Health Department, Old Court House,
Boston, March 23, 1899.

To the School Committee, City of Boston:

Dear Sirs,— The Board of Health would respectfully call your attention to the poor sanitary condition of the Dudley Street Grammar School-house, and say that repeated complaints, examinations, and reports to the School Committee and the Superintendent of Public Buildings have been made without avail, and covering a period of several years. Another examination has been made within a few days which shows the continued bad condition of the ventilation, the plumbing, and draining of the building.

There is a lack of traps, a defect in the drain, putty joints, insufficient flushing to water-closets, offensive odors from the basement, and a want of repairs otherwise in the building, and inefficient means of ventilation.

The Board of Health would respectfully, but earnestly, recommend that the sanitary condition of this building be improved as soon as practicable.

Very respectfully,
The Board of Health,
Samuel H. Durgin,
Chairman.

HEALTH DEPARTMENT, OLD COURT HOUSE,
BOSTON, March 24, 1899.

To the School Committee, City of Boston:

GENTLEMEN, — On complaint, the Board of Health has examined the sanitary condition of the following school buildings, and report as follows:

WINSHIP SCHOOL-HOUSE, BRIGHTON.

This is an old wooden building in fair state of repair, but the rooms are very much overcrowded. Ventilation is poor. The drainage is defective, and the waste-pipes from the sinks appear to discharge into a cesspool in the yard. The drainage from the flush vaults is connected with the sewer. The flush vaults are too near the school-rooms, are offensive, and in cold weather are unfit for comfortable use by the children. Rain conductors, without traps, discharge into the flush vaults and open at the roof in a direct line with the windows of the upper school-rooms.

BENNETT SCHOOL.

The vault for this school is located in the yard, and the contents of the vault in the annex are discharged into it. This vault is constantly in a filthy and offensive condition, the only means of flushing is by attaching a hose. The building is not heated, and in cold weather is unfit for use by the children.

ANNEX TO THE BENNETT SCHOOL.

Flush vaults in basement defective and offensive. There is no means of ventilation from the basement where these vaults are located, and doors to basement are close to doors leading to the school-rooms from the lower floor so that the odors from the basement permeate the school-rooms on this floor.

Very respectfully,
THE BOARD OF HEALTH,
SAMUEL H. DURGIN,
Chairman.

HEALTH DEPARTMENT, OLD COURT HOUSE,
BOSTON, April 25, 1899.

MR. E. I. ALDRICH:

DEAR SIR, — Your letter to Dr. Marion concerning the repairs in the High School building and the question of suspending the school for two or three weeks has been referred to me by Dr. Marion for answer. I beg to say that to do this work while the school is in session would be an unnecessary addition to the present danger to the pupils, and it should not be done. I also beg to say that I deem it important that this work should be done without delay, and that it does not require two or three weeks for its completion. I will guarantee to furnish you a man who will do the entire work during the usual suspension of school for one week, and unless the work is all completed within that time no bill shall be presented for the work. This shall be by a concern which has no superior in New England in the plumbing business.

Yours very truly,
SAMUEL H. DURGIN,
Chairman.

HEALTH DEPARTMENT, OLD COURT HOUSE,
BOSTON, November 27, 1899.

To the School Committee, City of Boston:

GENTLEMEN, — Upon examination of the Sherwin Schoolhouse, made November 24, the Board of Health begs to make the following report:

The waste from sinks runs into flush vaults in the basement. Trap under sink in boiler-room siphons is not effective. Lead waste-pipes under sinks on second story are improperly connected with the iron pipe. Offensive pan water-closet in toilet-room in the basement. The waste from the set bowl in the same room has no separate trap, but discharges into the trap of the water-closet. Vent-pipe from drain opens into brick flue in the basement. Offensive odors from flush vaults and slate urinals in the basement.

Very respectfully,
SAMUEL H. DURGIN,
Chairman.

MEDICAL INSPECTION OF SCHOOLS.

The total number of children examined in the public schools during the year is less than in 1898, owing to the fact that in 1898 a special examination was made of the children's heads for a special reason. The number examined otherwise, however, was somewhat larger than the average, and the number of infectious diseases found exceeded that of any previous year, as will be seen by the tabulated list of diseases given below.

It is gratifying to note the fact that the medical inspection of schools, which was started in Boston in 1894, after a four years' persistent struggle to inaugurate this work, has been already adopted by many of the American cities, and is steadily growing in favor wherever it has been adopted or is being discussed.

The subjoined table gives the results of the inspections:

TABULATION OF REPORTS OF MEDICAL INSPECTORS OF THE SCHOOLS AND AGENTS OF THE BOARD OF HEALTH OF BOSTON FOR THE YEAR OF 1899.

List of Diseases found in the Schools.

Summary:

Specific infectious diseases	468
Oral and respiratory diseases	2,738
Diseases of the ear	144
Diseases of the eye	434
Diseases of the skin	3,252
Miscellaneous diseases	10,413
	17,449

There has been an actual increase in the number of inspections made this year over last, except in the matter of examinations for pediculi, a special examination having been made for this in 1898. An increase in the number of sick children has been found in each of the above groups for this year.

Number of pupils examined in the schools	17,449
Number recommended to be sent home	2,583
Number consultations with teachers (about pupils returning to school, etc.)	3,089

NOTE.—In further diagnosis the nomenclature of Osler's Practice of Medicine is recommended.

I.—SPECIFIC INFECTIOUS DISEASES.

Diphtheria	13
Scarlet fever	5
Measles	85
Whooping-cough	134
Mumps	77
Small-pox	—
Chicken-pox	82
Influenza	61
Erysipelas	1
Syphilis	—
Tuberculosis	5
Malaria	5
	468

II.—DISEASES OF THE ORAL AND RESPIRATORY TRACT.

1. *Mouth.*

Stomatis:	
(*a*) Simple (erythematous)	8
(*b*) Aphthous (herpetic)	—
(*c*) Ulcerative	—
(*d*) Parasitic (thrush, etc.)	—
Alveolar abscess	26

2. *Pharynx.*

Acute pharyngitis	507
Hypertrophic pharyngitis (acute and chronic)	33

3. Tonsils.

Acute follicular tonsillitis..	1,285
Hypertrophic tonsillitis.....	550
Abscess..................	—

4. Uvula.

Elongation................	7

5. Nose.

Acute rhinitis.............	31
Chronic rhinitis...........	5
Purulent rhinitis..........	13
Ozaena..................	9
Deviations of septum.......	1
Epistaxis................	23

6. Naso-Pharynx.

Naso-pharyngitis (Post-nasal catarrh).............	25
Adenoid disease...........	27

7. Larynx.

Acute laryngitis...........	39
Chronic laryngitis.........	2

8. Bronchi.

Acute bronchitis...........	141
Chronic bronchitis.........	3
Acute pleurisy............	3
	2,738

III. — DISEASES OF THE EAR.

Foreign bodies (cerumen, etc.)...................	7
Otitis media, catarrhal, acute	2
Otitis media, chronic.......	—
Otitis media, suppurative, acute..................	3
Otitis media, suppurative, chronic................	121
Mastoiditis...............	—
Imperfect hearing (without visible cause)...........	11
	144

IV. — DISEASES OF THE EYE.

1. Foreign Bodies.

Foreign bodies............	7

2. Eyelids.

Blepharitis...............	13
Stye....................	22
Ptosis...................	1
Trichiasis...............	1

3. Lachrymal Organs.

Obstruction of duct........	1
Abscess..................	—

4. Conjunctiva.

Conjunctivitis:	
(*a*) Acute catarrhal......	148
(*b*) Purulent............	2
(*c*) Phlyctenular.........	5
(*d*) Granular............	11

5. Cornea.

Interstitial keratitis........	5
Ulcer....................	16
Opacity..................	6

6. Iris.

Iritis....................	1
Synechiae................	—

7. Muscles.

Strabismus...............	19
Nystagmus...............	2
Paralysis of extra-ocular muscles................	—
Imperfect sight (without visible cause)...........	178
Unclassified..............	6
	434

V. — DISEASES OF THE SKIN.

Acne....................	28
Alopecia areata...........	10
Dermatitis...............	55
Eczema..................	288
Erythema multiforme......	2
Erythema simplex.........	18
Furunculus...............	20
Herpes { simplex.........	70
{ zoster..........	4
Impetigo contagiosa.......	199
Pediculosis...............	2,292
Pemphigus...............	4
Pityriasis maculata et circinata.................	—
Pruritus.................	2
Psoriasis................	5
Purpura.................	—
Scabies..................	39
Seborrhoea...............	32
{ favosa..........	13
Tinea { tricophytina........	104
{ versicolor..........	—
Urticaria................	31
Verruca.................	6
Unclassified..............	10
	3,252

VI. — MISCELLANEOUS DISEASES.

Anæmia.................	86
Debility.................	94
Headache (habitual).......	170
Carried forward.......	350

Brought forward	350
Cervical adenitis	78
Chorea	17
Ulcer	25
Deformities { spinal	4
extremities	—
Dislocations	2
Sprains	47
Fractures	2
Contusions	49
Wounds	68
Abscess	33
Dental caries (painful)	27
Carried forward	702

Brought forward	702
Neuralgia	37
Epilepsy	8
Rheumatism	21
Cardiac diseases	8
Gastric diseases	97
Intestinal diseases	25
Urinary diseases	8
Vaccinations (performed)	1,016
Certificates of vaccination	1,896
"No disease," (no pediculi, no vaccination, marks, etc.,	6,510
Unclassified	85
	10,413

Following is a list containing the names of the Medical Inspectors of schools and the stations where culture tubes may be procured, January 31, 1900.

MEDICAL INSPECTORS OF SCHOOLS.

J. L. Ames, 72 Chestnut street, Brimmer School, Kindergarten, Parochial, Fayette-street School.

H. D. Arnold, 188 Warren street, Roxbury High School, Lewis Grammar School, Primary, Quincy street; Primary, Monroe street; Primary, Winthrop street, Primary and Kindergarten, Warren street.

S. H. Ayer, 318 Shawmut avenue, Franklin, Waite, Cook, Parochial, Cathedral, German Parochial.

W. B. Bancroft, 597 Broadway, Hart, Capen, Bird, Parochial, Kindergarten.

W. S. Boardman, 57 Hancock street, Eliot, Ware, Freeman, Parmenter, North Bennet Kindergarten.

J. P. Broidrick, 67 South street, J. P., West Roxbury High, Creighton street, Leo XIII. Parochial.

J. S. Brownrigg, 16 Delle avenue, Parochial, Kindergarten.

J. E. Butler, 310 Warren street, George Putnam, St. Joseph Parochial, St. Francis Parochial.

A. B. Coffin, 555 Washington street, Dorchester High, school in store on Washington street, Gibson on School street, Gibson on Morse street, Atherton, Glenway Primary, Glenway Kindgergarten.

R. M. Cole, 456 Broadway, Shurtleff, Lincoln, Clinch and Burnham.

D. A. Collins, 11 Parmenter street, St. Mary's Parochial, St. Stephen's Parochial, Moon-street Public.

W. P. Coues, 90 Charles street, Wells, Winchell, Poplar street, North Russell street, Chambers street Primary and Chambers street Kindergarten.

J. T. Cutler, 20 Crawford street, Edward Everett, Harbor View, Savin Hill and Athenæum.

J. G. Dearborn, 2 Wood street, Charlestown, Harvard, Harvard Primary and Common street Primary.

Charles G. Dewey, 539 Talbot avenue, Minot, Bailey-street Primary, Henry L. Pierce.

J. W. Dewis, 579 Tremont street, Mt. Pleasant avenue, Yeoman street, Dearborn, Eustis street.

John Duff, 4 Dexter row, Warren, Mead street, Cross street and Charlestown High.

D. G. Eldredge, 15 Monadnock street, Mather, Quincy-street Primary.

Wm. H. Ensworth, 7 Chelsea street, E. B. Adams, Plummer Primary and Assumption Parochial schools.

Theo. C. Erb, 551 Columbus avenue, Everett, Dwight, Rutland, Concord, Joshua Bates.

Wm. E. Fay, 290 Commonwealth avenue, Hyde, Sherwin, Leon-street Branch, Parker-street Branch, Day Nursery.

Wm. H. Grainger, 408 Meridian street, Chapman, Tappan, Parochial.

E. M. Greene, 49 Hancock street, Bowdoin, Somerset, Sharp, Phillips, Grant, Baldwin on Chardon street.

J. S. Greene, 1107 Washington street, Dor., Gilbert Stuart, Morton-street Primary, Stoughton, Tileston, Adams-street Primary.

F. A. Higgins, 22 Marlboro' street, Quincy, Winthrop, Primary, Way street; Primary, Genesee street; Primary, Tyler street; Dennison Kindergarten.

E. M. Holden, 178 Huntington avenue, Comins, Martin.

F. C. Jillson, Hastings street, W. Roxbury, Robert G. Shaw, Mt. Vernon street, Baker street.

J. S. H. Leard, 16 Weld Hill street, Agassiz, F. H. Primary, Margaret Fuller Primary, Bowditch, Hillside Primary, Chestnut avenue.

Francis Magurn, 112 Main street, Charlestown, Frothingham and Moulton street Primary.

H. E. Marion, 5 Sparhawk street, Brighton High, Bennett Grammar and Annex, Winship Primary, Union-street Primary and Kindergarten.

O. H. Marion, 22 Harvard avenue, Harvard, Everett, Allston, Webster.

Wm. J. McNally, 31 Monument square, Prescott, Medford-street Primary, Polk-street Primary.

R. M. Merrick, 15 Adams street, Harris School, Dorchester-avenue Primary, Henry L. Pierce, Thetford-avenue Primary, Lauriat-avenue Kindergarten.

G. P. Morris, 702 Broadway, Andrew, Ticknor, Roger Clap.

T. J. Murphy, 372 Dudley street, Hugh O'Brien, George-street Primary, Howard avenue, St. Patrick's Parochial.

J. F. O'Brien, 401 Bunker Hill street, Bunker Hill Grammar, Parochial.

E. F. O'Shea, 5 Chelsea street, E. B., Lyman, High, Cudworth, Fitton.

J. C. D. Pigeon, 130 Warren street, Dudley, Dillaway.

H. L. Plummer, 728 Saratoga street, Emerson, Noble, Chapel on Bennington, Blackinton and Star of the Sea.

H. S. Rowen, Bennett street, Bennett, Oak-square Primary, Warren Grammar, Faneuil Primary, St. Joseph's Academy, Allston, Auburn Primary.

J. H. Sherman, 534 Broadway, Bigelow, Hawes, Simonds.

C. M. Smith, 15 Charles street, Horace Mann, Prince, Perkins.

Henry B. Stevens, 79 Park street, Longfellow, Charles Sumner.

F. W. Stuart, 550 Broadway, Norcross, Cyrus Alger, Drake.

W. F. Temple, 240 Huntington avenue, Rice, Boys' Latin, Boys' High, Girls' Latin, Girls' High.

A. H. Tompkins, 20 Seaverns avenue, J. P., Lowell, Wyman street, Lucretia Crocker, Heath street, Centre street, Sunnyside street, Baptist chapel, Marcella-street Home.

H. F. R. Watts, 372 Dorchester, Gaston, Tuckerman, Pope, Kindergarten.

Francis J. Weller, 580 Broadway, Lawrence, Mather, Howe, Parochial.

Franklin W. White, 416 Marlboro' street, Hancock, Cushman, Parmenter street, Kindergarten, Sheafe street and Moon street.

DIPHTHERIA CULTURE STATIONS.

For the convenience of physicians, boxes containing culture tubes may be obtained of the following apothecaries:

CULTURE STATIONS.

Downey & McCormick, Thompson square, Charlestown.
Draper, William, Sullivan square, Charlestown.
Alexander, G. H., 100 Dorchester street, South Boston.
Jones, James T., 855 Fourth street, South Boston.
Copley, A. H., 45 Hancock street, Dorchester.
Connelly & Davis, 1442 Dorchester avenue.
Connelly & Davis, 760 Washington street, Dorchester.
Connelly & Davis, 64 Walnut street, Neponset.

Rogers, C. B., 701 Centre street, Jamaica Plain.
Drury, L. D., Dudley and Warren streets, Roxbury.
Sheppard, S. A. D., Dover and Washington streets.
Tilton, A. W., 71 Prince street, city.
Tilton, A. W., Hanover and Parmenter streets.
Squires, G. W., 113 Cambridge street, city.
Canning, Henry, 57 Chambers street, city.
Wheeler, W. D., Massachusetts avenue and Beacon street.
Archer, Fred W., Washington street, Dorchester Lower Mills.
Jeffers, S. T., 728 South street, Roslindale.
Countie, C. J., 25 Charles street, city.
Woods, E. A., 281 Centre street, Jamaica Plain.
Moore, F. W., Cambridge street, Allston.
Warren, G. W., 343 Washington street, Brighton.
Reid, T. T., 3101 Washington street, Roxbury.
Swallow, F. O., Centre street, West Roxbury.
Loring, F. M., 122 Harvard street, Dorchester.
Colley, Frank S., 610 Tremont street, city.
Clark & Mahoney, 101 Saratoga street, East Boston.
Metcalf, Theodore, Copley square, city.
Metcalf, Theodore, 39 Tremont street, city.
Greene, W. F., 573 Talbot avenue, Ashmont.
Brackett, C. L., Heath and Bromley streets.
Ernst, Frank O., 186 Lamartine street, Jamaica Plain.
Pratt, Fred L., 575 Columbus avenue, city.
Sawyer, W. F., 1152 Tremont street, Roxbury.
Cramer, Max, Columbus avenue and Roxbury Crossing.
Tessier Bros., Dorchester and Savin Hill avenue.
George, Alvin, Jr., 381 Warren street, Roxbury.
Joyce, Thomas, 141 West Broadway, South Boston.

UNDERTAKERS.

Appointed annually by the Board of Health in accordance with Pub. Stat. 1890, Chap. 210, Sect. 1.

LIST OF UNDERTAKERS, CITY OF BOSTON.

Abrams, Barnett, 4 Williams-street terrace, Roxbury.
Alexander, Alexis, 100 Wayland street, Dorchester.
Alexander, J. H., 610 Fifth street, South Boston.
Avdon, Michael, 67 Salem street, Boston.
Badaracco, Andrew A., 11 North Bennet street, Boston.
Balfe, Thomas J., 258 Broadway, South Boston.
Banks, Walden, 170 Cambridge street, Boston.
Barry, Michael, 371 Harrison avenue, Boston.

Belgard, Philip, 15 Arnold street, Roxbury.
Bernstein, Morris H., 26 Parmenter street, Boston.
Brady, Patrick J., 177 Green street, Jamaica Plain.
Briggs, Frederick L., 20 Howard street, Boston.
Brown, Edwin G., 232 Meridian street, East Boston.
Brown, Frank E., 252 Meridian street, East Boston.
Bryant, Chas. A., 2 Woodstock avenue, Brighton.
Bryant, John E., 15 Austin street, Charlestown.
Bryant, T. Weston, 15 Austin street, Charlestown.
Burke, Edmund C., opp. Jamaica Plain station.
Burke, John B., 75 Chambers street, Boston.
Callahan, Timothy F., 52 Warren street, Charlestown.
Cangiano, Michael, 212 North street, Boston.
Carpenter, Geo. S., 251 Tremont street, Boston.
Caro, Solomon M., 19 Catawba street, Roxbury.
Casey, Francis P., 56 Warren street, Roxbury.
Cassidy, William J., 120 Harrison avenue, Boston.
Chester, Charles E., Trinity Church, Boston.
Clark, William C., Long Island.
Cleary, J. P., 5 Pynchon street, Roxbury.
Cobb, Charles W., 99 Main street, Charlestown.
Cobb, Frank L., 97 Hyde Park avenue, Jamaica Plain.
Cobe, William, 18 Worthington street, Roxbury.
Colbert, Charles E., 144 Harrison avenue, Boston.
Cole, Harry H., 9 Hancock street, Dorchester.
Connell, Austin H., 815 Albany street, Roxbury.
Cosmo, M. J., 12 Battery street, Boston.
Crane, F. E., 565 Tremont street, Boston.
Crane, Horace R., 25 Walnut street and 1859 Dorchester avenue, Dorchester.
Crogan, James P., 87 Chelsea street, Charlestown.
Crosby, Elizabeth A., 10 Warren street, Roxbury.
Crosby, Joseph P., 100 Hampden street, Roxbury.
Curtis, David H., 397 Dudley street, Boston.
Dacey, C. M., 82 Main street, Charlestown.
Dolan, Chas. B., Dorchester avenue, cor. Richmond street.
Dolan, James W., 1380 Dorchester avenue, Dorchester.
Dooley, David J., 147 London street, East Boston.
Doolin, John, 211 Third street and 245 Dorchester street, South Boston.
Doyle, Thomas, 2212 Washington street, Roxbury.
Eastman, Alman L., 251 Tremont street, Boston.
Fallon, John D., 736 Centre street, Jamaica Plain.
Farrell, Michael A., 1336 Tremont street, Boston.
Feeley, Thomas, 128 Freeport street, Dorchester.
Feeney, John, 364 Hanover street, Boston.

Field, George V., 214 Dorchester street, South Boston.
Field, Geo. P., 214 Dorchester street, South Boston.
Fitzgibbon, Edward D., 1345 Dorchester avenue, Dorchester.
Flax, Harris, 3½ Barton street, Boston.
Gallivan, Joseph C., 204 Broadway, South Boston.
Gilmore, Edward J., 1455 Tremont street, Boston.
Gleason, E. F., 345 Washington street, Dorchester.
Gleason, R., 345 Washington street, Dorchester.
Guggenheim, Joseph, 111 West Brookline street, Boston.
Haynes, John O., sexton Emanuel Church, Newbury street.
Hill, George, South street, Roslindale.
Hogue, Alphonse, 10 Isabella street, Boston.
Hutchins, Basil, 726 Shawmut avenue, Boston.
Jacobovitz, Myer, Centre street, West Roxbury.
Jacobs, Louis, 110 Pleasant street, Boston.
Jones, Lewis L., 50 LaGrange street, Boston.
Keating, Thomas J., 322 Bunker Hill street, Charlestown.
Kelly, Bernard, 310 Bowdoin street, Dorchester.
Kelly, Michael J., 37 Maverick square, East Boston.
Lane, Thomas J., 120 Havre street, East Boston.
Langone, Joseph A., 218 North street, Boston.
Lavery, Frank W., 54 A street, South Boston.
Lavery, John W., 54 A street, South Boston.
Leary, Lewis W., 146 Broadway, South Boston.
Linnehan, C. P., 98 Kneeland street, Boston.
Lippa, William, 19 Stillman street, Boston.
Maloney, Frank S., 123 Maverick street, East Boston.
Mann, Lewis A., 145 Dudley street, Roxbury.
Marsh, W. W., 475 Cambridge street, Brighton.
Mannheimer, Herman, 1623 Washington street, Boston.
McCaffrey, Christopher P., 75 Albany street, Boston.
McCaffrey, John, 75 Albany street, Boston.
McCartney, Timothy, 328 Bunker Hill street, Charlestown.
McCugh, Hugh, 4278 Washington street, Roslindale.
McMackin, Bernard, 80 Bunker Hill street, Charlestown.
Metcalf, Eugene H., 24 Franklin street, Allston,
Mitchell, M. J., 324 Bunker Hill street, Charlestown.
Morris, Jerome S., 165 London street, East Boston.
Morris, John J., cor. London and Porter streets, East Boston.
Morris, Lawrence F., cor. London and Porter streets.
Muldoon, Joseph L., Market street, Brighton.
Mullen, James, 84 Charlestown street, Boston.
Mullen, M. J., 650 Broadway, South Boston.
Mullen, Patrick H., 650 Broadway, South Boston.
Murdock, James E., 2048 Washington street, Roxbury.
Murphy, Michael J., 428 Hanover street, Boston.

Murray, E. A., 29 Thatcher street, Boston.
Murray, Frank A., 29 Thacher street, Boston.
Nolan, John E., 380 Broadway, South Boston.
O'Donnell, James F., 204 Broadway, South Boston.
Peak, John H., 1374 Washington street, Boston.
Peak, John H., Jr., 1374 Washington street, Boston.
Peyser, Jacob, 39 Hammond street.
Rafferty, Patrick H., 60 Chambers street, Boston.
Raftery, Thomas E., 1034 Tremont street, Boston.
Reade, George E., 263 Dover street, Boston.
Reade, Vincent de P., 187 Main street, Charlestown.
Reade, Vincent de P., Jr., 187 Main street, Charlestown.
Regan, Martin, 1032 Tremont street, Roxbury.
Ring, Timothy F., 205 D street, South Boston.
Roach, Edward E., 191 Pynchon street, Roxbury.
Roeder, John R., Henshaw street, Brighton.
Roles, Roswell, 730 Shawmut avenue, Roxbury.
Ruemker, Frank H., 296 Roxbury street., Roxbury.
Silverstein, Myer L., 238 Hanover street, Boston.
Slyne, William F., 249 Dorchester street.
Spencer, W. F., 204 Broadway, South Boston.
Sprague, John W., 120 Meridian street, East Boston.
Stanetsky, Jacob, 13 Wiget street, Boston.
Stokes, Waldo J., Park street, West Roxbury.
Sullivan, J. F., 358 Market street, Brighton.
Sullivan, Samuel J., 545 Harrison avenue, Boston.
Sullivan, T. J., 332 Broadway, South Boston.
Tinkham, Charles F., 20 Howard street, Boston.
Tinkham, Jeremiah, 20 Howard street, Boston.
Tondorf, Joseph B., 129 Shawmut avenue, Boston.
Vinal, Frederick, Deer Island.
Walsh, John F., 91 Chelsea street, Charlestown.
Waterman, Frank S., 2326 Washington street, Roxbury.
Waterman, George H., 2326 Washington street, Roxbury.
Watson, Bernard L., 52 Warren street, Roxbury.
White, Henry M., 728 Dudley street, Roxbury.
Willard, George A., 110 Dorchester street, South Boston.
Williams, N. M., 1386 Washington street, Boston.
Williamson, Joseph, 29 Vernon street, Roxbury.
Wittenberg, Solomon, 66 Salem street, Boston.

STABLES.

Hearings were had on 145 applications for the occupancy of stables with the following result: granted, 102; refused, 22; applications withdrawn, 10; dropped for not fulfilling requirements, 3; and 8 are still awaiting action.

EXAMINATION OF PLUMBERS.

During the year ending January 31, 1900, the Board of Examiners held fifty-two meetings, and examined 320 candidates for plumbers' licenses; 77 were for master plumbers' licenses and 37 (or 48 per cent.) passed the examination, and were certified to the Building Commissioner for license. Two hundred and forty-three were examined for journeymen plumbers' licenses and 135 (or 55 per cent.) passed the preliminary examination, and were notified to report at the shop for the practical test. Of this number 111 passed successful examinations at the shop and were certified for licenses.

There were in addition fifty-two candidates whose examinations became necessary by a neglect to renew their licenses on May 1. Eighteen of this number were masters and thirty-four journeymen. Six masters and ten journeymen failed to pass the examination.

EXAMINATION OF GAS-FITTERS.

During the year ending January 31, 1900, the Board of Examiners held the following meetings for the examination of candidates for gas-fitting:

Number of applications for licenses referred by Building Commissioner to Board of Examiners.		328
Number of examinations held		45
Number of applicants examined by Board . .		220
Masters	96	
Journeymen	124	
Number of applicants examined certified by Board to Building Commissioner for license .		52
Masters	30	
Journeymen	22	
Number of examination papers rejected, applicants not receiving requisite percentage . .		168
Masters	66	
Journeymen	102	

GAS-FITTING.

Defective gas-pipes and fixtures have been followed up the past year as was done in 1897 and 1898, and with equal satisfaction. This work is considered by the Board of Health as of greater importance than that which is done upon leaky and otherwise defective waste and drain pipes, inasmuch as the air from waste, drain, and sewer pipes is extremely mild in its unhealthful effects upon the people, when compared with the slow poisoning, or the sharp and fatal results of illuminating gas from leaky gas-pipes and gas-fixtures. It would be interesting to show the amount of sickness caused by illuminating gas, but such data is not now available. The number of deaths recorded from this cause in Boston for the last seven years may be seen in the following table, which shows a constantly increasing number each year:

1893	25	1897	43
1894	33	1898	54
1895	28	1899	48
1896	40		

APPOINTMENTS.

The Board organized on the first Monday in May by the choice of Samuel H. Durgin, M.D., as chairman, and Charles E. Davis, Jr., as secretary.

March 2, Dr. Charles G. Dewey was appointed a Medical Inspector of Schools in place of Dr. Twitchell, resigned.

April 10, Dr. H. F. R. Watts was appointed a Medical Inspector of Schools in place of Dr. Draper, resigned.

May 24, Albert F. Sherman was appointed Superintendent at Gallop's Island.

June 24, John F. McConnell was appointed Superintendent of the Detention Hospital in place of James McCarty, resigned.

August 15, Marsalina Saffrino was appointed Captain of the steamer "Vigilant" in place of Captain Ranlett, resigned.

August 15, Fred J. Critchett was appointed mate of the steamer "Vigilant" in place of Saffrino, promoted.

September 28, Dr. Franklin W. White was appointed a Medical Inspector of Schools in place of Dr. Craigin, resigned.

September 28, Dr. J. G. Dearborn was appointed a Medical Inspector of Schools in place of Dr. Bateman, resigned.

September 28, Dr. W. P. Coues was appointed a Medical Inspector of Schools in place of Dr. Ewald, resigned.

October 13, W. E. Jamieson was appointed Superintendent of the Detention Hospital in place of J. F. McConnell, discharged.

November 23, Dr. Francis Magurn was appointed a Medical Inspector of Schools in place of Dr. Knight, resigned.

SAMUEL H. DURGIN, M.D., *Chairman.*
GEORGE F. BABBITT.
EDWIN L. PILSBURY.

FINANCIAL STATEMENT.

EXPENSES FOR TWELVE MONTHS ENDING JANUARY 31, 1900.

Board of Health	$12,500 00	
Clerk-hire	10,915 83	
Messenger	711 61	
Inspector of nuisances	27,390 24	
Inspector at abattoir	1,267 87	
Medical inspectors	7,600 02	
Disinfection	14,603 04	
Detention hospital	2,648 83	
Medical inspection of schools	9,814 12	
Vaccination	2,176 34	
Laboratory	6,946 83	
Nuisances and demolition of buildings	3,090 94	
Morgue	392 96	
Postage	230 00	
Telephones	508 06	
Travelling expenses — officers	1,563 70	
Office expenses	1,202 84	
Horse and Vehicle — Board of Health and Medical Inspectors	2,008 44	
Stationery	644 27	
Printing	4,026 85	
Advertising	60 39	
Examination of plumbers and gas-fitters	615 00	
Quarantine	18,573 33	
Inspection of milk and vinegar	11,289 90	
Inspection of provisions	2,926 66	
Superintendent of pedlers	936 00	
Public urinals	300 00	
Other contagious diseases	76 69	
		$145,020 76

RECAPITULATION.

Appropriation	$145,000 00
Income	20 76
	$145,020 76
Amount expended	145,020 76

REPORT OF DIRECTOR OF BACTERIOLOGICAL LABORATORY.

To the Board of Health:

GENTLEMEN, — I have the honor to submit the following report for the year ending January 31, 1900:

The work of the laboratory consisted of routine examinations, including the diagnosis of diphtheria, typhoid, glanders, malaria, rabies, influenza, etc., examinations for pus-organisms, and other diagnostic work for physicians and veterinarians, and special investigations, including bacteriological tests of public telephones, examination of the ice supply, and testing of disinfectants. The making of mallein for the use of the department in the diagnosis of glanders has become part of the regular work. Beginning with the year 1900 the examination of suspected tubercular sputum is to be carried out.

The number of cultural examinations for the diphtheria bacillus during the past year was greater than for any previous year since these examinations were begun in Boston. Other lines of work have increased also. Reports to physicians are made by telephone in all positive cases for diagnosis, and in all cases where the first examination is unsuccessful. A number of culture stations have been added to the list.

Research work has been carried on as time permitted, and the results of the necessarily slow progress in this direction will be published when completed.

The first part of this report deals with laboratory methods, of the second part with the results of the routine work and a description of the special work and results. The appendix gives tabular statements of the routine work, illustrating the points discussed in Part II.

PART I.

METHODS.

Diphtheria Diagnosis.

Outfits. — The copper boxes heretofore in use have been retired, and pasteboard boxes substituted. The latter are decidedly lighter and cheaper than the former, notwithstanding that the "life" of the latter is much the shorter. The pasteboard box is of the same general pattern and dimensions as the copper box. It contains the same tubes, directions, etc. These boxes are disinfected after use, by exposure to formaldehyde vapor and used again until worn out.

Culture Stations. — The outfits are distributed to certain regularly appointed drug stores, known for this purpose as "culture stations." There they are kept for two months, or until called for by a physician who wishes to take a culture. After the culture is taken the physician returns the outfit to the culture station, from which it is forwarded to the laboratory. The culture should reach the station not later than will allow ample time for its arriving at the laboratory by 6 P.M. (A list of culture stations is given on page 55.)

Incubation. — On receipt of the culture outfit at the laboratory the patient's name is immediately recorded, the box is credited to the station from which it comes, and the card is stamped with the date of receipt. At 6 P.M. all the boxes received during the day are placed in the incubator at 37° C. for examination next morning at 8.30.

Reports. — The diagnosis, + or —, is marked on the card at the time of the morning examination. As soon as the cards are marked they are compared with the card catalogue consisting of cards previously received. They are thus classified: The positives as primary or secondary cards; the negatives as primary, or, if for release, as first or second negatives. The report to the department is then made out, and individual reports sent by mail to the physicians. All positive results for diagnosis and all results unsatisfactory for any reason are reported to the physician by telephone. Many other cases are reported by telephone at the request of the physician, and many calls are received from physicians, asking for reports. The number of telephone calls relating to this work alone was about 3,500 for the year.

Release Cases. — By a regulation of the Board of Health two consecutive negative cultures were required from each case reported as diphtheria by the physician, or showing diphtheria bacilli on examination in the laboratory, before isolation was officially terminated and disinfection performed. Cases yielding positive cultures from both nose and throat were required to show two consecutive cultures from the nose and two from the throat.[1] In all cases, the second negative is taken by the medical agent of the district in which the patient resides. When a first negative culture for release is obtained the medical agent of the district in which the case exists is notified by mail to take a culture. If this prove negative it constitutes the required second negative. Should this culture be positive, a "first negative" must be again obtained, and so on, until the required two *consecutive* negatives are received. The Board of Health is then at once notified and disinfection proceeded with. The ruling is made that two negative cultures in succession will not be considered as first and second negatives, if both were made on the same day.

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[1] Beginning May 15, 1900, two consecutive negative cultures from both nose and throat will be required for release in *all* diphtheria cases.

Swabs and Five-Hour Examination. — When requested, the laboratory is ready at all times during hours (9 A.M. to 5 P.M., Saturdays, 9 A.M. to 1 P.M., Sundays, 9 A.M. to 10 A.M.) to examine the *swabs* from cases for *diagnosis* directly. It has been found that in about one-half of the cases finally proving positive after the ordinary incubation, a positive diagnosis can be made from the swab without waiting for incubation, thus saving from fifteen to twenty-four hours. A negative result from the swab is unreliable. In such cases, if the culture has been brought into the laboratory before 12 M., a *five-hour incubation* may be given and reported on at 5 P.M., except on Saturdays, Sundays and holidays. A negative result from this examination also is unreliable, and the regular over-night incubation must then be proceeded with.

Positive results from the swab, the five-hour or the over-night incubation are equally reliable.

Removal of Cases to the City Hospital. — By arrangement with Dr. J. H. McCollum, any case on which a positive result is reported from this laboratory will be accepted at the City Hospital as showing the presence of diphtheria bacilli, and will only be discharged on obtaining the regular release cultures. Under this agreement a report on all the positive cultures obtained in this laboratory each day is forwarded to Dr. McCollum. The isolation of well persons carrying diphtheria bacilli is not involved, however, in this agreement. When the hospital is crowded preference will be given to membrane cases.

Classes of Cases Eligible for Examination. — Boston physicians may send cultures from patients resident within or outside of Boston. Physicians resident outside of Boston may send cultures from patients resident in Boston. When both physician and patient reside outside of Boston the cultures should be sent to the State Board of Health.

Typhoid Fever.

The dried blood method for the Widal reaction is used. The outfit consists of aluminum foil (after Wesbrook), on which the blood is to be dried, let into three-layer cards, carrying also a small cooper wire loop (after Johnson) for transferring the blood to the foil. The card gives directions for handling the foil and wire. With this card is sent another card, to be filled out by the physician, and a circular of directions. All three fit into a manila envelope for safe keeping, and the whole is mailable for two cents postage. The outfits are sent by mail on receipt of requests therefor at the laboratory. After the physician has taken the blood preparation it is returned to the laboratory by mail. The examination is made thus: The dried blood on the foil is mixed with ten times as much sterile water; a drop of this dilution is mixed on a coverslip with a drop of broth containing typhoid bacilli, making a total dilution of one in twenty. This preparation, mounted as a "hanging drop," is observed at intervals under the microscope for from thirty minutes to one hour. If only loss of motility or only clumping is observed the preparation is called atypical, and another requested. If both occur, a positive, and if neither, a negative report is sent. A new typhoid culture on agar, reaction + 15 (1.5 per cent. acid) is made every day from a previous agar culture one month old. This ensures that there shall always be an agar culture one month old in the laboratory. From this month-old agar is made also every day a broth culture (+ 15 initial reaction) which is ready for use next day after incubation for twenty-four hours at 37° C.

L. B. Wilson's Modification of Widal-Johnson Test. — The writer willingly concedes the excellence of the method as used by the Minnesota State Board of Health. The blood is placed on a very thin piece of foil, which is then folded. The blood dries, and on receipt at the laboratory may be readily flaked off and weighed on a delicate balance. Thus very accurate dilutions may be obtained. For research work no more accurate method is yet devised, but the writer believes the method in use here is efficient for diagnosis.

Malaria.

The outfit consists of a small flat tin box which contains half-a-dozen clean coverslips wrapped in paper (after the Massachusetts State Board of Health.) On application to the laboratory, one such box, accompanied by a circular of directions and a card to be filled out with the particulars of the case by the physician, is mailed to the address given. The outfit should be returned to the laboratory by mail. Upon receipt of the coverslips, with the blood smeared on them as directed, the examination is carried out. Futcher's method is followed.

This in its latest form is here given.

Fixative: —

Formalin, ¼ to ½ per cent. solution in 90 per cent. alcohol.

Stain: —

Thionin, 50 per cent. alcoholic solution — 20 c.c.
Carbolic acid, 2 per cent. solution — 100 c.c.

Fix for one minute in the formalin solution. Remove formalin with blotting paper. Stain with the thionin solution for ten to fifteen seconds, wash in water and mount. As a rapid stain for diagnosis this method is excellent, although a better method for fine work is that of Romanowsky.

Glanders.

This service was organized at the suggestion of Dr. Alexander Burr, veterinarian to the Boston Board of Health.

The outfit consists of a cylindrical copper box containing an eight-inch test tube, a card for particulars of the case and a circular of directions. The test tube contains a large swab of a design similar to that used for the diphtheria work. The cotton used is absorbent, however, instead of the non-absorbent used for the diphtheria swab, because in glanders the object sought is the accumulation in the cotton of as much as possible of the suspected material. The outfits are sterilized each time before being sent out, and are kept at the same culture stations with the diphtheria outfits. On receipt of an outfit from the veterinarian the swab is transferred to 5 c.c.'s of sterilized water and shaken thoroughly in it. The resulting suspension is inoculated intra-abdominally into well-grown male guinea-pigs, and a positive or negative diagnosis is usually based upon the development or non-development of scrotal inflammation in from two to seven days, after further examination of the tissues in every case for the isolation of the organism.

Cases Eligible for Examination. — Boston veterinarians may send preparations from horses whose owners are resident either within or outside of Boston. Veterinarians resident outside of Boston may send preparations from horses, the owners of which reside in Boston, or from horses stabled or working in Boston, although their owners are non-residents.

If the veterinarian resides outside of Boston and the horse is stabled and works outside of Boston, preparations may be sent if the owner is a resident of Boston. Otherwise the preparations should go to the State Board of Cattle Commissioners.

Pathology and Bacteriology of the Guinea-pig Lesions. — The lesions produced by inoculation of a male guinea-pig with pure cultures of the *Bacillus mallei* (bacillus of glanders) are most commonly nodular deposits in the viseral layer of the *tunica vaginalis*, which, in the guinea-pig is continuous with the peritoneum. The nodules extend into the testicle and also to the outer layer of the *tunica.* The testicle enlarges, and, as a result of this enlargement and of the formation of the nodules, becomes adherent in the sac, in sharp contrast with the condition in health, when the testicle may readily be pushed upward into the peritoneal sac of the abdomen. Infiltration of the scrotal tissues, with œdema sometimes extending into the groin and the supra-pubic region, are also found. Sometimes only one testicle is extensively affected and adherent. (See plates.)

Other lesions are often not evident, especially when the guinea-pig is killed early, as is usual in this service. Sometimes, however, nodular deposits in the peritoneum, omentum, mesentery, liver, spleen, lungs, and lymphatic glands are found in the male, generally with scrotal lesions, but sometimes without. In the female the lesions are the same, omitting the scrotal lesions. According to Wright (Journ. Expt. Med., Vol. I., No. 4, Nov., 1896) the process resulting in a nodule is a primary necrosis, due to the glanders bacillus, followed by imflammatory exudate, often suppurative.

The glanders bacillus may be detected in the nodules, mounted direct. It is a short, thick rod, with rounded ends, usually slightly curved or bent, sometimes elongated in a thread form. It stains only faintly with Löffler's methylene blue, and often shows unstained spaces within its outline. Transfer of a portion of a nodule to potato at 37° C. results in the development within twenty-four to forty-eight hours of small, smooth, glistening, amber-colored colonies, increasing slowly in size and depth of color. If the potato is very moist the color develops very slowly. The bacillus obtained from these colonies resembles more or less the form presented in the nodules, but on potato, as on other media (agar, broth, gelatin, etc.), the morphology is variable. On account of these variations, together with the occasional presence of branched forms, and the tendency of the organism to produce nodules in the living tissues, there is some reason to classify

DESCRIPTION OF PLATES.

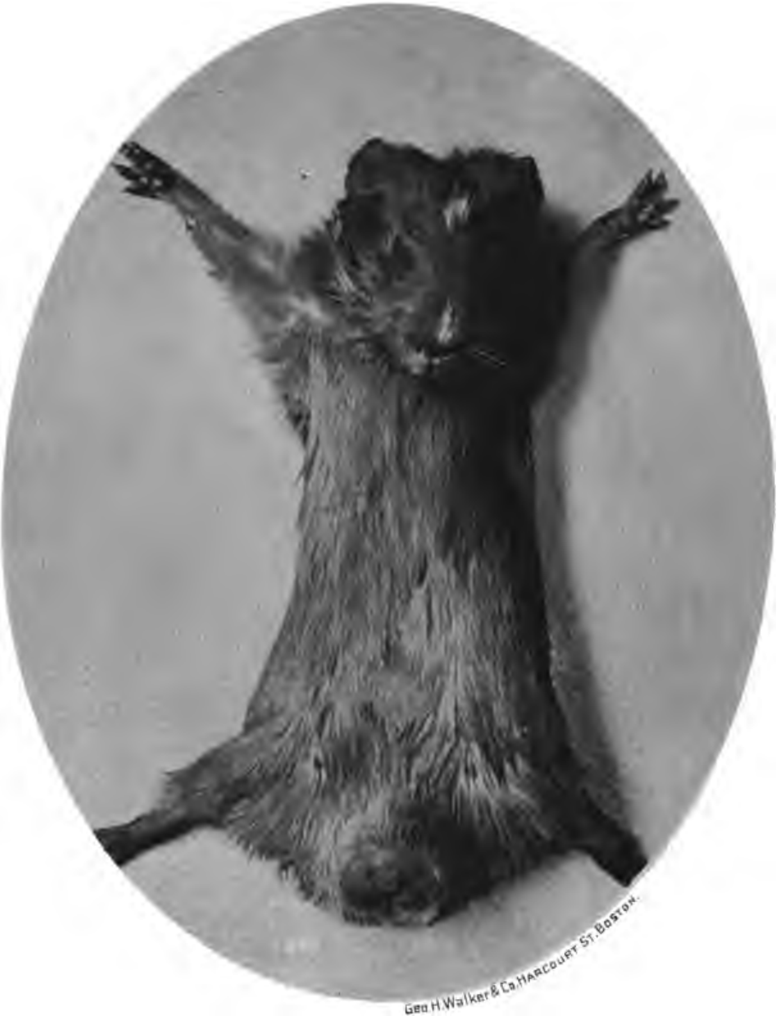
Lesions Found as Result of Inoculation with Glanders.

Plate I. Guinea-pig (dead), showing enlargement of both testicles from the exterior.

Plate II. Guinea-pig.— Male. Intestines, kidneys, and spermatic receptacles removed. Scrotal tissues dissected off, leaving testicles *in situ.* The left testicle is seen enlarged, and its lower half covered with nodules. The whole testicle was found in the scrotal sac and adherent thereto. The fat surrounding the spermatic vessels is seen, swollen and œdematous above the testicle. The right testicle was lying in the peritoneal cavity, a small part of its lower end resting in and adherent to the scrotal sac. The lower end shows several discrete nodules. On the right side of the testicle is a nodule, elongated transversely. This testicle was but little enlarged, and the fat above it but little infiltrated. In the median line is the penis. Above the penis is the bladder, and passing to each testicle above the bladder are the *vasa deferentia* of the cord.

Plate III. is a photograph of a part of the same guinea-pig, giving a higher magnification.

PLATE I.



Geo. H. Walker & Co. HARCOURT ST. BOSTON.

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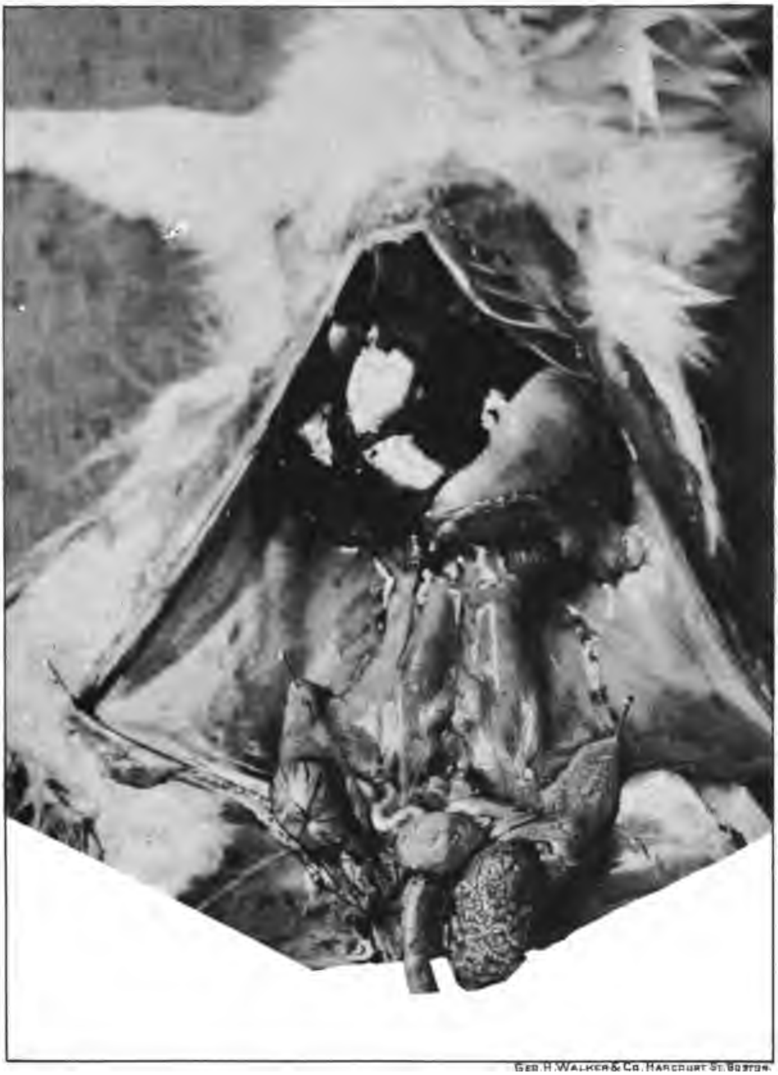
PLATE 2.



GEO. H. WALKER & CO. HARCOURT ST. BOSTON.

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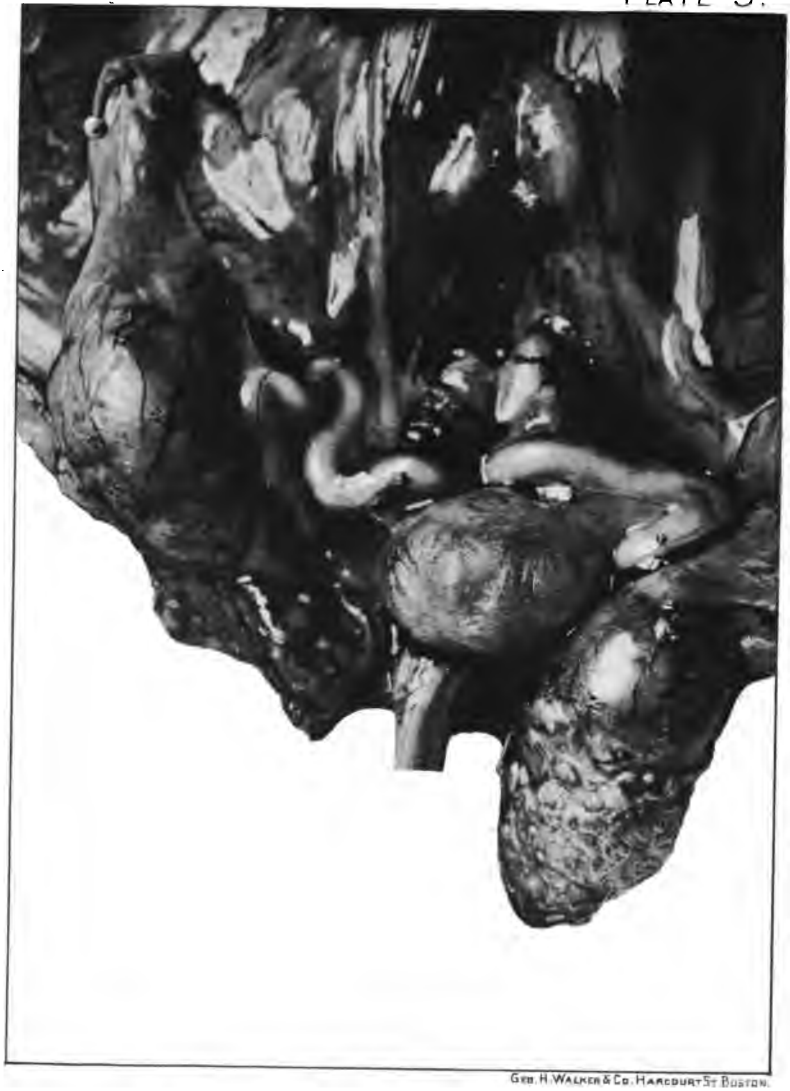
PLATE 3.



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this "bacillus" with those of tuberculosis and actinomycosis, which are not improbably streptothriceae rather than bacilli, in the present sense of the latter term.

Under the conditions of this test, when used for diagnosis, it is well to isolate the glanders bacillus from the lesions before giving a final positive diagnosis. It is especially desirable to do so if only peritoneal lesions are found. If lesions are found anatomically atypical, a negative diagnosis should be withheld until cultures have been obtained. This for the reason that in one case examined here the only lesions found were two nodules, one on each side, in the peritoneum overlying the spermatic vessels at their entrance to the scrotum, swelling and adhesion of the testicles being absent, but the glanders bacillus being found in these lesions. Even when the guinea-pig dies of acute peritonitis (as described beyond), due to injection with acute septic organisms mixed with the glanders bacillus, it may sometimes be possible to isolate the glanders bacillus from the mixture found in the peritoneal cavity. On the other hand, in another case, a swelling and adhesion of one testicle was shown to be due to organisms other than the glanders bacillus.

Interpretation of Results of Guinea-Pig Test. — On injecting a guinea-pig with the emulsion obtained from a swab taken from a suspected horse, a mixture of organisms is usually introduced into the peritoneal cavity, especially if the preparation comes from the horse's nose. This mixture may or may not contain the glanders bacillus. If the glanders bacillus is not present, and no other pathogenic organism in sufficient numbers or of sufficient virulence to produce death is present, the guinea-pig, after a few hours or days of depression, recovers completely. If the glanders bacillus be present, and the other organisms also present fail to kill, the typical scrotal lesions or the peritoneal lesions will develop, the former within twenty-four to seventy-two hours usually, the latter later on. If, however, acute septic organisms be present in the injected liquid, the guinea-pig is likely to die within twenty-four hours, whether the glanders bacillus be present or not, before the glanders lesions have time to develop. In such cases the test is evidently of no value, and should be repeated. Such a result certainly fails to demonstrate the presence of the glanders bicillus, so that a positive report is impossible. It also fails to demonstrate its absence, since experimentally it has been shown that a guinea-pig injected with a pure culture of glanders, mixed with a pure culture of the pneumococcus (the latter isolated from a case of acute peritonitis in a guinea-pig injected for diagnosis), may die within twenty-four hours, without glanders lesions. A negative report based on such a case is evidently out of place, and therefore an " unsatisfactory result " is reported, accompanied by a request for another preparation. In brief, the following summary of the relation of the guinea-pig result to the diagnosis in the horse may be given:

Guinea-pig inoculation *positive* (scrotal or peritoneal lesions, with isolation of the glanders bacillus) — lesion in horse positive (glanders).

Guinea-pig inoculation *negative* (guinea-pig survives without lesions) — lesion in the horse negative (not glanders).

Guinea-pig inoculation *unsatisfactory* (guinea-pig dies within a short time, without development of typical lesions and without isolation of glanders bacillus) — lesion in the horse undetermined (no diagnosis).

It must be remembered that a negative diagnosis may occasionally be obtained from a lesion in the horse, due to the glanders bacillus, but from which the glanders bacillus has disappeared, or has been outgrown by other organisms. In some cases a faulty technique in collecting the specimen may have existed. Moreover, a negative result may be obtained, and be correct, from one lesion in a horse, whereas another lesion may yield a positive result, the first lesion in such cases being due to other causes than glanders, notwithstanding that the horse was infected with glanders at the time. Thus more than once a negative result from an ulcer on the leg has been accompanied by a positive result from the nose of the same horse.

Swab Examinations, and Cultures direct from the Swab. — Occasionally a direct microscopic examination of the material obtained from the suspected horse will show an organism which is indistinguishable from the glanders bacillus. A diagnosis can rarely if ever be made by this method, since the glanders bacillus presents no morphological characters so distinctive as to permit of its absolute recognition under the microscope alone. In some cases also a direct inoculation on potato from the swab will result in the development of typical glanders colonies. This is a reliable method if the glanders bacillus be isolated, but unfortunately rarely succeeds in practice.

The results of the glanders diagnostic service, most of which were obtained by Dr. Burr, working in this laboratory, will be found in the Appendix to this report.

Rabies.

Rabies is examined for by injecting under the dura (exposed by trephining) of a full-grown rabbit half a c.c. of an emulsion consisting of about one gram of the brain or spinal cord from the suspected animal in 10 c.c.'s of sterile water, filtered through absorbent cotton and paper. The trephine hole is just posterior to a line joining the centres of the eyes. Paralysis or convulsions developing after fourteen days, followed by death, is good evidence of the presence of rabies, if other lesions can be excluded by a careful autopsy of the rabbit, with cultures from blood and organs. Two rabbits at least should be inoculated with the same material in each case.

Complications due to B. Diphtheriæ. — The necessity for a careful autopsy, including cultural tests, of the suspected animal when possible, and of the experimental animal in all cases, before giving a positive diagnosis, is emphasized by a case reported by L. B. Wilson, in which the diphtheria bacillus was detected in the brain of a patient dead of supposed rabies. Rabbits inoculated subdurally from the brain of this patient shown apparently typical rabic symptoms, but it was conclusively demonstrated by a series of experiments, that their symptoms were due to the diphtheria bacillus. It was shown also that the effects due to the diphtheria bacillus could be eliminated by the use of diphtheria antitoxin, thus permitting the diagnosis of a case of mixed infection with rabies and diphtheria bacilli, if such should be presented for examination. (Head and Wilson, Jour. Expt. Med., Vol. IV., Nos. 3 and 4, May–July, 1899.)

Complications due to B. Aerogenes Capsulatus. — As an evidence of other difficulties, which may be encountered in the diagnosis of rabies by inoculation of rabbits, the following summary of a case occurring here is appended:

The brain of a deerhound, suspected of rabies by the attending veterinarian, showed under the microscope a large bacillus subsequently identified as *B. aerogenes capsulatus.* The rabbits inoculated from this brain and from anaerobic cultures of the bacillus died within twenty-four hours, yielding the bacillus in large quantities in the tissues and showing, on autopsy, the presence of gas in the heart and blood vessels, and of gas-cysts in the organs. Subsequent events showed that this deerhound probably had not suffered from rabies, but it is difficult to see how a diagnosis of rabies, had it existed, could have been made by rabbit inoculation, under the circumstances.

Gonorrhea.

Gonorrhea is examined for by two methods. The first is the direct staining of the discharge itself, sent in spread as a thin film on coverslips or slides, by the method of Gram, followed by Bismarck Brown in aqueous solution. The more or less biscuit-shaped gonococci are then seen as brown diplococci, often lying in cells; other cocci which sometimes resemble the gonococcus in shape, arrangement and situation, retain the Gentian-violet stain of Gram's method, thus showing purple in contrast to the gonococci which lose the purple stain under the Gram treatment and become brown on adding the Bismarck Brown. The second method resembles that used for the diphtheria diagnosis, in that cultures are made on Wasserman's nutrose-serum-agar, described in the 1898 report, and the organism thus isolated for subsequent examination. The first method is applicable to acute cases where the infection is likely to be almost pure or the gonococci present in decided excess of the other organisms. The second method allows of plating if necessary, and is applicable to later stages, where the gonococcus may be obscured by the presence of considerable numbers of other organisms.

Influenza.

Influenza is examined for by direct staining of nasal or bronchial discharges, and by cultures from these regions and from the blood on glycerine agar, on the surface of which sterile human or pigeon's blood has been smeared. Sputum, etc., for examination, should be sent to the laboratory in small sterile wide-mouthed bottles, properly stoppered and labelled.

Disinfectants.

In the examination of a disinfectant the following points must be considered:

I. Bactericidal action.

1. Absolute — the action of the disinfectant in various degrees of dilution on pure cultures of bacteria, exposed to the disinfectant in the most isolated condition, that is, without admixture with salts albumens, etc. This condition is best obtained by using, first, cultures from solid media, suspended in distilled water or normal salt solution, and, second, cultures from solid media, dried upon some chemically inactive substance.

2. Practical — the action of the disinfectant in various degrees of dilution on pure cultures of bacteria exposed to the disinfectant in the conditions most commonly found in practice, that is mixed with sewage, feces, urine, sputum, etc., or dried on wood, cloth, leather, etc.

II. Physical and chemical characters, including stability.

III. Physiological action — effect on man and lower animals.

IV. Range of application — to surgical work, disinfection of infected liquids, feces, etc., disinfection of rooms, etc.

V. Convenience in storage, handling, etc

VI. Cost.

To complete the examination for scientific purposes the effect of the disinfectant on ptomains, its ability to inhibit growth and reduce virulence, and various other points not directly essential to practical sanitation should be worked out also.

Preparation of Media.

This, a very important part of bacteriological work, was discussed in the report of 1898. It is sufficient to say here that the methods then employed have been continued without change. Owing to an epidemic of *B. subtilis*, or some allied form in the laboratory, resulting in a number of liquified serum tubes, the method of collecting serum at the abattoir was modified successfully by substituting granite-ware pails for the glass jars previously used, and directing that these should be thoroughly washed and sterlized with steam after each use, at least weekly. A siphon for drawing off the serum was devised of hard and soft rubber tubing combined, so arranged that it could be set running without applying the mouth to the orifice through which the serum escapes. Disinfection of the media room with formaldehyde gas was also done. The result of these measures was an almost complete disappearance of the organism from the laboratory media.

A table is appended, showing the method in use for making the three principal media, other than Löfflers serum :

Method for Making Nutrient Broth, Nutrient Gelatin and Nutrient Agar.

		Boil thirty grams thread Agar in one litre of water for half an hour. Make up to a weight of 1,000 grams. *Cool and solidify, or use hot if preferred.*
NUTRIENT BROTH.	NUTRIENT GELATIN.	NUTRIENT AGAR.
1. Infuse lean meat 20 hours with twice its weight of distilled water in refrigerator. Say 1,000 grams meat. " 2,000 grams water.	Ditto.	. Infuse lean meat 20 hours with its *own* weight of distilled water in refrigerator. Say 1,000 grams meat. " 1,000 grams water.
2. Make up weight of meat infusion (and meat) to original weight by adding water, *i.e.*, to 3,000 grams.	Ditto.	Ditto. *i.e.*, to 2,000 grams.
3. Filter infusion through cloth to remove meat.	Ditto.	Ditto.
4. Titrate and record reaction of filtrate. Say reaction + 2.2%.	Ditto.	Ditto. Say reaction + 4.2%.
5. Weigh filtered infusion. Say 1,800 grams.	Ditto.	Ditto. Say 900 grams.
6. Set infusion on water bath, keeping temperature below 60° C.	Ditto.	Ditto.
7. Add peptone, 1%, 18 grams, salt, .5%, 9 grams.	Ditto and sheet gelatin 10%, 180 grams.	Add peptone, 2%, 18 grams, salt, 1%, 9 grams.
8. After ingredients are dissolved, titrate; reaction probably + 2.3 to + 2.5.	Ditto. Prob. + 4.0 to + 5.0.	Ditto. Prob. + 4.5 to + 4.7.
9. Neutralize, Fuller's method.	Ditto.	Ditto.
		To the 900 grams of meat infusion (containing now peptone and salt) add 900 grams of the 3% Agar jelly described at the head of this column.

10. Heat over boiling water (or steam) bath thirty minutes.

11. Restore weight lost by evaporation to original weight of filtered meat infusion, for broth and gelatin, and to *twice* that weight for agar — to 1,800 grams in *each case.*

12. Titrate, reaction probably + 0.3 to + 0.5 per cent.

13. Adjust reaction to final point desired, say + 1.5 per cent.

14. Boil five minutes over free flame, with stirring.

15. Add water, if necessary, to make up loss by evaporation, to 1,800 grams.

16. Filter through absorbent cotton, passing the filtrate through the filter repeatedly until clear.

17. Titrate to determine whether or not the desired reaction has been maintained.

18. Tube and sterilize.

For methods of titration see Journal Am. Pub. Health Ass'n, October, 1895, and January, 1898. Also, Massachusetts State Board of Health, 1895; Fuller and Copeland.

Storage of Media.

Media of all kinds are kept for use, ready tubed, in square wire baskets, which the writer finds most convenient when not more than four inches deep, the tubes being five and six inches long. This ensures the projection of the tubes above the top of the basket and makes their handling more easy. Each basket is labelled with the name of the medium (broth, plain agar, glycerine agar, etc.), the date of its preparation and a number corresponding with the records kept of its preparation. An excellent label consists of a small piece of aluminum foil attached to the basket by a wire ring. The name can be written on the foil with the blue Faber pencils used for writing on glass. These labels have the advantage that they will pass through the steam sterilizer without effacement. The baskets of media are kept in a refrigerator. The writer finds that drawers with perforated sides and bottoms, fitted into the lower part of an ordinary refrigerator, make the most convenient method of storage. When tubes are removed from any basket for use, the name of the medium and its number is copied from the aluminum label on the test tube label. Thus every culture made carries with it a reference to the records showing when and how the medium was prepared, its exact composition, etc.

Preparation of Mallein.

Notwithstanding the occasional inaccuracy of the mallein test for glanders, it supplies a diagnostic factor of considerable value; mallein has been prepared by Dr. Burr for the use of the Board of Health in this laboratory.

Ordinary nutrient broth is used to which has been added five per cent. of pure re-distilled glycerine. The reaction is adjusted to + 15 (1.5 per cent. acid) and the broth is then sterilized in litre flasks, about 400 to 500 c.c.'s. in each flask. After incubation at 37° C. for three days to test sterility, each flask is weighed with the broth it contains and the weight recorded. The weight of the flask being known the weight of the broth is easily ascertained.

B. mallei, grown on plain nutrient agar at 37° C. for forty-eight to seventy-two hours, is inoculated into each flask, preferably by rubbing the loopful of bacilli on the inside of the flask wall at the upper level of the broth, in order to secure the formation of a surface pellicle. Melted paraffin is then poured on the surface of the cotton plugs after burning them down to the level of the flask mouth, and the flasks are incubated at 37° C. for four to six weeks. The surface pellicle should begin to develop in two or three days, but sometimes requires a week or ten days. It appears as a white, moist, opaque viscid mass at the edge of the upper level of the broth, which by that time is cloudy with the growth of the bacilli. It develops by extension from this mass, or sometimes by detached islands of membrane floating on the surface. These are flat and semi-transparent, resembling films of paraffin at first, but soon increase in diameter and become whitish, opaque and wrinkled, simulating somewhat the surface pellicle formed by *B. subtilis*. At the end of the period specified most of the membrane has usually disappeared, breaking up and settling to the bottom of the flask.

The mallein cultures are then concentrated by boiling to one-half the original weight, filtered through a porcelain or Berkenfeldt bacterial filter, sterilized, filled into sterilized bottles containing one or two c.c.s. each and again sterilized. They are then ready for use. One-half per cent. of carbolic acid may be added as a preservative.

A note by Dr. Burr on the diagnostic value of mallein as found in the Boston Board of Health work, is given in his report.

PART II.

Summaries of Routine and Special Work for the year ending January 31, 1899.

ROUTINE EXAMINATIONS.

[See Tables in Appendix.]

Diphtheria Diagnosis.

Table I. shows the weekly totals of cultures received, and the total positive, negative, and no growth results obtained from the primary cultures, *i.e.*, the first cultures received from each new case. A rise from the beginning to the end of February is followed by a considerable fall to the middle of April. Rising again through May, a fall in the middle of June and a return thereafter to the May level in July, August and September is followed by a gradual rise through the remainder of the year, terminating in January.

Table II. shows the classification of the cultures into primary and secondary, and the sub-classification of each of these into those for diagnosis and those for release. In order to understand why there are primary cultures for release, it is necessary to remember that many cases are examined by cultures for the first time after the disease has run its course when the question of release from isolation comes up, the diagnosis having been made on clinical evidence alone. The secondary cultures for diagnosis are made up of those cases in which the first culture was unsatisfactory or the clinical evidence did not appear to the physician to bear out the bacteriological result on the first culture.

Table III. shows the classification of cases as positive, negative and no growth. The positive cases include all positive cases, both for diagnosis and release. The negative cases include all those on which no positive culture was received at any time. The no-growths are those cases on which only unsatisfactory cultures were received.

It will be seen that while the total of cultures for this year was a little more than double the total for the preceding nine months of the existence of the laboratory (7,930 as against 3,948) the total of cases examined in 1899 was more than two and one-half times the total for the same period (4,536 as against 1,747 in 1898).

Table IV. shows the total cases in which a positive result was obtained for diagnosis, and illustrates also the fact that a single negative result, and even occasionally two successive negative results, may be obtained from a case in which the bacilli, nevertheless, are finally found. The percentage in which the first examination was successful is slightly higher than that obtained last year (95.3 per cent. as against 92.5 per cent.). It is only fair to state that in this, as in the corresponding table of the last annual report, it is quite possible that a number of cases turned out to be diphtheria, after a negative report from this laboratory, of which no further record reached us.

Table V. shows the relation between the clinical diagnosis given by the physician at the time of making the culture and the bacteriological diagnosis furnished by the laboratory from the physician's culture.

The physician's diagnosis of diphtheria was confirmed by the laboratory in about 60 per cent. of cases as compared with about 56 per cent. last year. The physician's diagnosis of "not diphtheria" was reversed in almost exactly the same percentage of cases in both years (11 per cent.). A larger percentage of positive results from the "doubtful" cases was, however, obtained (22 per cent. against 15 per cent. last year). The theoretical concordance (see table) was slightly greater than that obtained last year.

Table VI. requires no comment. The number of examinations made under this head (cases merely exposed to diphtheria but showing no symptoms) was too small to justify any deductions. In this connection a closely allied question, that of the presence of diphtheria bacilli in the throats of healthy people *not* exposed to cases of diphtheria has been investigated (Zeit. f. Hyg. 31, p. 463), and is quoted by Dr. S. W. Abbott in Gould's "American Year-book of Medicine and Surgery" for 1900. The investigator found $\frac{4}{5}$ of 1 per cent. of such persons yielded the bacillus of diphtheria, or four persons out of 500.

Another allied subject, the presence of diphtheria bacilli in throats where the clinical symptoms and course of the disease simulate closely an acute tonsillitis or simple angina, was investigated by Biggs in 1896. (Report of the New York Board of Health, 1896.) The results showed that 6 per cent. of the bacilli so found were non-virulent, but in the remaining cases Biggs attributed the symptoms to the virulent bacilli found, and concludes with the statement that the diphtheria bacillus is responsible wholly or in part for such cases.

The infectiveness of persons carrying the bacilli in their throats after recovery from diphtheria, or even without development of symptoms at any time, cannot be questioned. If a patient suffering from the disease is capable of infecting others (undisputed), and if such a patient infects others by the transfer to them from his mouth, directly in the act of expectorating, coughing, sneezing, etc., or indirectly through fomites, of virulent diphtheria bacilli (also undisputed) it is impossible to believe otherwise than that a person in health similarly distributing virulent diphtheria bacilli is similarly capable of infecting others. Actual and conclusive evidence on this matter is naturally hard to establish in individual cases. Nevertheless, here and there such cases occur. Thus, Chase of Brookline holds that an epidemic of diphtheria, apparently traceable to milk supply, originated from infected throats of otherwise healthy milk-handlers. While this is the most striking recent and local evidence on the subject, cases have been observed by Chapin of Providence and Park of New York amongst others. The latter quotes a case of infection of the mother and nurse of a recovered child on the ninety-first day of persistence of bacilli in the latter.

It is evident, however, that the number of diphtheria bacilli usually present in a recovered or always healthy but infected throat, is smaller than the number present during the course of the disease, and that for portions of the time they are present only in the folds or follicles of the mucous membrane (indicated by the fact that negative cultures may intervene between two positive cultures). These cases are intrinsically less liable to infect others than are active cases of the disease. Nevertheless, in the face of evidence showing even occasional danger from healthy but diphtheria-carrying persons, it is advisable, in the writer's opinion, to take proper precautions to obviate the danger whenever the danger is evident.

Table VII. shows the advantage of two consecutive negative cultures for release, demonstrating the fact that a single negative culture followed by a positive has been obtained in thirty-one per cent. of the total positive cases released by us. Such negatives are designated as premature negatives, since they seem to show the absence of the bacilli from the throat before the bacilli have in fact disappeared.

Table VIII. needs no comments other than those accompanying it.

Table IX. shows the results obtained from the swab examinations and five-hour incubations made. The percentages of successful results are somewhat smaller than those obtained and published heretofore in this laboratory, but are still sufficiently large to make this feature of the work a very valuable one.

Typhoid Diagnosis. — The work of this service is much less complicated than that of the diphtheria diagnosis, and the tables therefore need little comment. The total of the examinations made during the year is nearly four times the number made during the previous nine months (483 against 122). The total of the cases examined was six times as great (412 against 66).

Table IV. shows that about 84 per cent. of the finally positive cases were positive on the first examination, about 12 per cent. on the second examination, about 3 per cent. on the third or fourth.

Glanders Diagnosis. — The tables illustrate the facts already discussed in the section on Glanders (page 67 of this report.)

Table IV. shows the cases finally proving positive, and the number of tests required to obtain a positive result. This table shows that only 71 per cent. of these cases yielded a positive result on the first examination. Since the corresponding figures for diphtheria were 95 per cent., and for typhoid 84 per cent., it would seem that these two services yielded positive results on the first test more often than the glanders service. It is to be noted, however, that in the glanders table is included certain cases which turned out clinically to be glanders, in spite of unsatisfactory guinea-pig tests. Similar diphtheria and typhoid cases, doubtless existing, are nevertheless unavoidably excluded from the tables on diphtheria and typhoid, since reports on the final clinical results of these cases are seldom made to us. The glanders table is on this account really more accurate than the other two. Omitting, however, from these glanders cases, the finally clinically positive cases, to make the percentages comparable with those of the diphtheria and typhoid work, it will be found that the percentage of positive glanders cases positive on the first examination is 87 per cent., lying between the figures for diphtheria and for typhoid.

Investigation of a Suspected Case of Bubonic Plague.— Owing to the prevalence of this disease in various parts of the world, and the discovery of at least two cases on board ships admitted to the Port of New York, the chairman of the Board of Health deemed it advisable to prepare for the possible discovery of an imported case in Boston The writer was directed to secure cultures of the bubonic plague bacillus (*B. pestis bubonicæ*) and to institute a series of investigations concerning it, and to determine the efficiency of the sulphur disinfection recommended for vessels coming from infected ports. Cultures could not be obtained in Boston, but through the courtesy of Dr. W. H. Park of the New York Health Department, Dr. Durgin was able to secure and to bring with him from New York two cultures on agar, with which experiments were at once begun. Within three weeks of the receipt of these cultures, a suspected case was reported to the Board of Health by Dr. Irving of the Marine Hospital in Chelsea. Although on investigation the case proved not to be a case of plague, the possession by the laboratory of the cultures thus obtained was of great assistance in arriving at a diagnosis from the bacteriological standpoint.

The organism of bubonic plague was first detected by Kitasato and Yersin,[1] independently, and within a few days of each other, in 1894. Its morphology varies considerably. Fresh from the subject, it is a short, plump, non-motile bacillus, rather uniform in size and shape, sometimes presenting a capsule in tissues and frequently showing bi-polar staining, especially with carbol-thionin. On solid media, it presents a mixture of forms varying from almost coccoid to distinctly thread-like bodies. "Involution forms," irregular rods, with much expanded ends, staining irregularly, are common after incubation for forty-eight hours or more. Distinctly branching forms also occur. In liquid media, particularly in broth, it forms chains of various lengths, the individual rods being very short, so that at the first glance a streptococcus is strongly suggested. The organism grows best at 37° C., but also at 22° C., more slowly. Gelatin is not liquified, nor is milk coagulated. Potato presents a slight whitish film. Almost all the lower animals, particularly rats, are susceptible.

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[1] The descriptions given by these two bacteriologists differed in several important points. It is now generally conceded that Yersin's description was the more correct. The description here given applies to the Yersin bacillus, the form studied in this laboratory.

Adami describes the types of the disease in the human as bubonic, pulmonary, intestinal, typhus, ambulatory, pestis siderans and pestis minor.

The two principal forms are the bubonic and the pulmonary. The former is characterized anatomically by the swelling and œdema of the glands and surrounding tissues following an inoculation involving the lymphatics leading thereto. The pulmonary form is probably produced by inhalation of dust containing the organism or other direct transfer of the organism to the lungs. In epidemics it is not always possible to trace the infection with absolute clearness, but a direct contact or association with previous cases is the most common method. Rats, flies, etc., are also factors.

The bacteriological diagnosis is best made direct from the glands and œdematous tissue surrounding them, or from the sputum in the pulmonary form. The site of inoculation, if it can be determined, may or may not yield the bacilli. The fear inspired by the disease and the necessity for making the diagnosis as early and as absolutely as possible justify the cutting down on or tapping, *ante mortem*, the enlarged glands, under proper bacteriological precautions, in a suspected case of the bubonic form. In the pulmonary form it is sufficient to examine the sputum secured from the lungs.

A microscopical examination alone is not conclusive. The suspected material, distributed in sterile water or broth, should be plated out in agar, streaked out on agar slants and inoculated into rats. All suspicious colonies obtained from the plates or slants should be transferred to broth and potato, gelatin, milk, etc., and again incubated. In this way the organism may be isolated in twenty-four hours, partially identified in forty-eight, and in seventy-two hours the final test, that of death of the rats, with proper autopsy findings, will go far to establish the diagnosis. Isolation of typical bacilli from typical autopsies on the rats will complete the work.

SPECIAL EXAMINATIONS.

DISINFECTANTS.

The use of Sulphur Dioxid for Destroying the Plague Bacillus.

The regulations of the Marine Hospital service require that sulphur dioxid to the extent of 5 per cent. of the cubic contents of the space to be disinfected should be used to disinfect ships, with an exposure of twenty-four hours, when sulphur burning in pots must be employed. Where an approved form of blast furnace is available for injecting the sulphur into the ship, 10 per cent. of the gas with twelve hours exposure is required.[1]

Sulphur dioxid (the gas formed by burning sulphur in air) is ineffectual as a disinfectant in the absolutely dry state. Its efficiency increases with the humidity of the atmosphere. With large quantities of moisture in suspension in the air, the specified amounts of sulphur dioxid give very good bactericidal results. Sulphur is inappropriate for use in many cases, because of its action on dyes, metals, etc., and because its odor is very persistent. On the other hand, it is a cheap and easy method of disinfecting large spaces in which there is nothing liable to injury from the gas.

Since one kilogram of sulphur yields 700 litres of the gas, about four and one-half pounds thoroughly burnt furnishes fifty cubic feet of sulphur dioxid, which, if set free in 1,000 cubic feet of space, constitutes the required 5 per cent. of cubic contents. Since one part of water will dissolve at ordinary temperatures fifty parts by volume of sulphur dioxid so forming sulphurous acid, the real disinfecting agent, one cubic foot of water, or about eight gallons, ought to be supplied to each 1,000 cubic feet of space to insure the conversion of the fifty cubic feet of sulphur dioxid into sulphurous acid. To obtain this amount of water in suspension in the atmosphere is beyond the possibilities in ordinary practice. It remains advisable, however, to saturate the air as thoroughly as possible in order to get the best results.

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[1] The latest regulations require double these exposures.

Experimental work in this laboratory is necessarily subjected to many interruptions, since the routine work cannot be neglected. Two completed tests have, however, been made. A closet in the laboratory containing approximately 200 cubic feet was used in both experiments. In both experiments dry sulphur was used, no water being evaporated, since it was desired to test the efficiency in the relatively dry state first. A sufficient quantity of sulphur to produce 5 per cent., or ten cubic feet of gas was used. The temperature of the closet before, during, and after the experiment was taken, and the humidity before and after also. In both experiments the time from the lighting of the sulphur to the final opening of the closet was twenty-four hours. The sulphur was found practically completely burnt. In the first experiment a great leakage occurred from the closet, and at the end of the test only a very faint odor of sulphur remained. In the second experiment the leakage was greatly reduced by appropriate measures, and the odor left in the closet was fairly strong. Eighteen preparations, consisting of plague bacilli dried on glass, wood, and cloth were made in the first test; twelve preparations, all on glass, in the second. Controls were also made.

The results of the first test were as follows:

TEST OBJECTS EXPOSED.	SUBSEQUENT GROWTH.			
	Typical.	Coccoid Forms.	Unidentified Bacilli.	No growth.
Glass	1	..	2	3
Wood	1	1	1	3
Cloth	..	5	1	..

Two of the preparations of plague bacilli were not killed. Ten others showed growths, not plague bacilli, but other bacterial forms, doubtless deposited on the wood and cloth from the air of the closet, showing that, even if the plague bacillus was killed in these cases, the disinfectant action was not strong enough to destroy other bacteria. The highest temperature (40° C.) in the neighborhood of the exposed preparations was reached in thirty minutes, and immediately began to drop, reaching the original temperature (20° C.) about two and a half hours later.

In the second experiment no growth was obtained from any of the twelve preparations. The highest temperature (40–45° C.) was reached in twenty minutes and dropped to normal about two and a half hours later. The humidity at the beginning of the first experiment was 54, at the end, 54.5. For the second experiment the figure was 56, and remained unchanged.

The cultures used in both tests were about seventy-two hours old, grown on plain nutrient agar at 37° C. The test objects were prepared within half an hour of the beginning of the experiment, to prevent the effects of prolonged drying. Direct sunlight was avoided during the preparation. The closet itself was quite dark during the test. The closet was four feet wide, six and one-half feet high, about seven and one-half feet long. The test objects were placed on the floor, one set on each side of the sulphur and two sets on a shelf at each end of the room, about six feet from the floor. The shelf sets were thus from five to six feet distant from the sulphur and above it, the floor sets three or four feet distant, and from five to eight inches below the top of the pan containing the sulphur. Each "set" consisted in the first experiment of a glass rod, a piece of wood, and a piece of coarse towelling, all sterilized by dry heat and then inoculated with the plague bacillus. In the second experiment each set consisted simply of two glass rods similarly prepared. The tests for growth were made by rubbing the glass rods and the wood on the surface of plain nutrient agar, leaving the rods and wood in the tubes and incubating at 37° C, with observation for two weeks. The cloth was dropped into tubes of plain nutrient broth, and similarly observed. Microscopic and cultural examinations of the growths which resulted completed the test. The results may be summarized thus:

Four and one-half lbs. of sulphur per 1,000 cubic feet will kill plague bacilli, provided no great leakage occurs in the absence of great humidity, and after an exposure of twenty-four hours. Much less than this quantity of sulphur, or great leakage, will reduce efficiency. Further experiments are needed to confirm these and to determine the necessary time limit.

TELEPHONE EXAMINATIONS.

A bacteriological examination of the transmitters of public telephones was ordered by the Board of Health, and was undertaken by the laboratory in February, 1899.

A list of the public telephones most largely in use was obtained. A moist sterile swab of cotton was wiped carefully over the inside of the transmitter, and a second swab over the outside, in each case. The swabs were inoculated on the surface of serum tubes, and the latter incubated. The swabs were then shaken thoroughly with distilled water, and inoculations from the suspensions of bacteria thus obtained were made subcutaneously and intra-peritoneally into guinea-pigs. The serum tubes and guinea-pigs were thereafter kept under observation, the latter for three months.

The results obtained were as follows:

Serum Tubes. — No growth of any kind — 3 telephones. "Hay bacillus" (harmless) — 7 telephones. Other organisms (harmless) — 3 telephones.

Guinea-pigs. — One, inoculated subcutaneously, died in twenty-six days, with no appreciable lesions. Since the guinea-pig inoculated intra-peritoneally from the same suspension was alive and well three months later, and showed no lesions on being chloroformed and autopsied, the former guinea-pig must be considered as having died from causes other than the inoculation. The remaining guinea-pigs also survived for three months, were chloroformed and showed no lesions.

Notwithstanding these negative results, it must be conceded that a telephone transmitter is liable to be infected from direct contact of the lips of a person suffering from lesions of an infectious disease or carrying the bacteria of infectious diseases in the mouth. As diseases of this class may be mentioned syphilis, tuberculosis, diphtheria, and influenza. Loud talking, laughing, coughing, and sneezing while at the telephone is also liable to project a fine spray of saliva over the transmitter, the saliva carrying with it whatever organisms may be present in the mouth. Once the telephone is thus infected, it is possible for a subsequent user, especially if he follows closely after the person who infected the instrument, to become infected if his lips touch the transmitter.

While care should certainly be exercised in using a public telephone to avoid actual contact with the transmitter, it is unlikely that the public telephone is a frequent source of infection. The cleansing of public telephones with proper disinfectant solutions, such as 5 per cent. carbolic acid solution after each use, would prevent any danger which might otherwise exist.

The receiver, or ear-piece, of the telephone necessarily comes in contact with the external ear, and might also receive disinfection with advantage. The risk, however, is less than that involved in the use of public phonograph ear-tubes, which enter the auditory canal, and may sometimes transmit pus organisms and the discharges from suppurative middle-ear affections.

Attention is directed to private telephones in offices or families where one or more of those constantly using the telephone may be infected with a contagious disease, especially syphilis or tuberculosis. In such cases the opportunity for infection of the telephone is increased and also the opportunities for the infection of one of the other constant users of the same telephone. Under such circumstances, disinfection, as advised above, should certainly be carried out.

EXAMINATION OF ICE SUPPLY.

Under instructions from the Board of Health, the ice supply of Boston was investigated.

The following table shows the principal sources from which the Boston ice supply is obtained and the companies which obtained their ice from these ponds in 1899:

Ponds in New Hampshire.

Name of Pond.	Town.	County.	Area.	Outlet.	Ice Dealers Supplied.
Country Pond	Newton Jct.	Rockingham			B. I. Co.
Lovell's	Wakefield	Carroll			D.U.Co.; F.Co.; H.Co.; I.I.Co.
Pow-wow River	E. Kingston.	Rockingham			D.U.Co.; F.Co.; H. Co.
Three Ponds	Milton	Strafford			B.I.Co.; U. I. Co.; Downing.
West Ringe	West Ringe				Br. I. Co.
Winnepesaukee	Lakeport	Belknap			I. I. Co.

Ponds in Massachusetts.

Name of Pond.	Town.	County.	Area.	Outlet.	Ice Dealers Supplied.
Chebacco	Essex	Essex	260 acres	Essex river,	D.U.Co.; F.Co.; H. Co.
Flint	N. Grafton.	Worcester			B. S. Co.
Great Pond	S.Weymouth	Norfolk	288 acres	Mill River.	B. I. Co.
Hammond's	Newton	Middlesex	28 acres	Charles	B. I. Co.
Horn	Woburn	Middlesex	91 acres	Mystic	B. I. Co.
Massapoag	Sharon	Norfolk	460 acres	Mass.brook,	D. U. Co.; B. I. Co.; F. Co.; H. Co.
Mirror	Hudson	Middlesex			I. I. Co.
Morse	Wellesley	Norfolk			B. S. Co.
Leeches	N. Chelmsford	Middlesex	80 acres	Stonybrook,	B. I. Co.
Quannapowitt.	Wakefield	Middlesex	264 acres	Saugus	B. I. Co.
Maple Spring.	Jefferson	Worcester			Br. I. Co.
Sandy	Ayer.	Middlesex	80 acres.	Nonacanicus brook,	B. I. Co.
Silver	Wilmington	Middlesex	37 acres	Ipswich	U. I. Co.
Silver	Plympton	Plymouth	25 acres	Whetstone .	Abbott Bros.
Strong	Brighton	Suffolk	10-15 acres	Charles	Downing.
Third Mill pond	Littleton	Middlesex			Eames.
Wenham	Beverly	Essex	255 acres	Mill river	D.U.Co.; F.Co.; H. Co.
Washakum	Framingham	Middlesex			B. I. Co.
Wigwam	Dedham	Norfolk	32 acres	Charles	B. I. Co.
Charles river	Boston	Suffolk			W.R.I.Co.; H.I. Co.; Noone I. Co.
Milton river					Abbott Bros.

B. I. Co. = Boston Ice Co.
D. U. Co. = Drivers' Union Co.
F. Co. = Fletcher & Co.
H. Co. = Home Co.
Br. I. Co. = Brighton Ice Co.
H. I. Co. = Highland Ice Co.
I. I. Co. = Independent Ice Co.
U. I. Co. = Union Ice Co.
W. R. I. Co. = West Roxbury Ice Co.
B. S. Co. = Bay State Ice Co.

The ice for the Boston supply is usually cut in January and February, depending, however, on the character of the particular season. The ice is stored usually in ice-houses on the banks of the pond or river from which it is obtained. The ice is shipped to Boston by rail and delivered by carts directly from the freight cars.

Infection of ice in transit is not a matter of such moment as it is in the case of milk, the constant melting of the ice tending to wash off any surface contamination which it might receive, its solidity preventing any admixture through the ice of foreign material, and its temperature preventing any development in it of pathogenic bacteria.

Danger from ice is therefore to be looked for rather in the condition of the water previous to and during the process of freezing, and it has been properly held that no water unfit for drinking purposes should be a source of ice supply intended for domestic consumption.[1]

Under the Acts of 1895, 338, cities may make ordinances to prevent the sale of impure ice. While it is true that ice under certain conditions is more free from certain foreign constituents than the water from which it was produced, it remains true that a water supply directly and recently contaminated with dangerous bacteria, as typhoid bacilli, ought not to be approved for an ice supply, since typhoid bacilli resist freezing and will live for some time in ice.

In addition, however, to impurities of this nature, directly dangerous to public health, there are other considerations relating more to common cleanliness and decency on which it would seem proper to condemn a supply, even though actual danger of infection cannot be demonstrated.

Of such a nature would be contamination from street washings, the drainage of pig-pens, stables, etc. It may be difficult or impossible to show that these constitute a directly traceable source of disease, but it would seem proper to exclude from the ice supply of a great city any such sources of dirt, especially when better and purer supplies are easily available. On these grounds certain of the ponds above mentioned have been examined and reported on unfavorably.

These are Horn Pond, Lake Quannapowitt, and Strong's Pond. An abstract of the fuller reports made to the Board of Health is here appended, showing the conditions found in May, 1898.

Horn Pond is situated in the town of Woburn, near the village of Woburn, Middlesex County, Mass. Its area is about ninety-one acres. One of its two feeders, Dow's brook, is about three-eighths of a mile long and drains part of the village of Woburn, with privies and cesspools in its neighborhood. It receives street washings, and near its outlet to the pond is a stable of nine stalls, within twenty feet of the left bank.

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[1] State Board of Health Reports.

The second feeder, Fowle's brook, is about one-half mile long, and receives two tributaries, one draining a comparatively uninhabited region, the other being about one and one-half miles long and flowing south from the village of Cumminsville. The latter has upon its banks a piggery of about eight hundred pigs, fed chiefly upon garbage and refuse from the Boston restaurants. A subsoil drain-pipe leads from the pig-pen sixty or seventy yards into the brook.

The population of the water-shed per square mile is from 1,200 to 1,500 persons. On the eastern bank of the pond is situated the village of Woburn.

Lake Quannapowitt is situated in the town of Wakefield, County of Middlesex, Mass. It area is about 264 acres.

One of its two feeders, Bear Hill creek, is about two miles long, rising in the village of Reading.

The other, not named, of about the same length, receives the subsoil drainage and surface washings of the village of Reading. On the bank of one of the three tributaries of this stream is situated the privy of a piano factory, employing ten or twelve hands. This privy has no vault, the feces being deposited directly on the ground, within six feet of the stream. Another of its tributaries passes under a bicycle tire factory and within forty feet of a privy used for part of the year by 200 employes of the factory. The feces are deposited on the ground, there being no vault. In wet weather, the feces are carried off by the overflow of the tributary.

The population of the water-shed is 1,200 to 1,500 persons per square mile.

The village of Wakefield surrounds the southern part of the lake. The village is without regular sewers. Four cemeteries are situated close upon the banks of the lake.

Strong's or *Downing's Pond* is situated partly in Boston, partly in Newton. Its area is about ten to fifteen acres. Its water-shed is about one-half of one square mile. Within an eighth to a quarter of a mile the ground rises to a height of 140 to 200 feet, so that the pond is in a considerable depression, small in area.

Within this area are two tributaries, which unite to form a feeder, several cesspools, stables, and a cow-shed, besides a number of houses. The population per square mile is estimated at 200 to 300 persons. A dump used by the city of Newton for the deposit of old tins, canvas, paper, etc., is present near one of the tributaries. This pond is a favorite skating-ground in winter.

TUBERCULOSIS.

A number of questions were sent to various State and municipal boards of health throughout this country, to ascertain what is actually being done officially to control this infectious disease.

Replies were received from twelve State Boards and from six city boards. Two replies, from the Provincial Boards of Health of Quebec and Ontario, are included in the answers from States, since the provincial Board in Canada corresponds closely with the State Board in this country. The State Boards as a rule have only advisory powers, the executive devolving on municipal Boards. The State Boards have, therefore, usually answered questions relating to executive matters in the negative. Many "circulars of advice" from both State and municipal boards were received, and the general result of the inquiry was to elicit a very general belief in and desire for a more close investigation and supervision of tuberculosis by health authorities.

The State Boards which sent replies were those of California, Connecticut, Delaware, Illinois, Indiana, Louisiana, Maine, Minnesota, New Hampshire, North Carolina, Rhode Island, and Virginia, and the Boards of the provinces of Ontario and Quebec. The State Board of Illinois described itself as merely advisory, and specific answers to the questions asked were omitted.

The cities which responded were Baltimore, Buffalo, Charleston, Chicago, New York, and Pittsburgh. The city of Providence was recorded as desiring the reporting of cases, the advising of patients, disinfecting of premises, and supervising of attendance of tubercular children in schools, but stated that these were not at present in operation in the city. Two responses were obtained from Boards whose names were not appended.

The following shows the questions asked and the replies obtained:

1. Does your bacteriologist make free examinations of sputum for physicians? States: Yes, 5; no, 8. Cities: Yes, 6; no, 0. Total, yes, 11.

2. Do you require the reporting of cases of tuberculosis? States: Yes, 4; no, 9. Cities: Yes, 3; no, 3. Total, Yes, 7.

3. Do you inspect reported cases or advise the patient in any way? States: Sent circulars of advice, 3; no, to both questions, 9. Cities: Yes, to both questions, 1; no, to both, 3. Circulars sent, 2.

4. Do you isolate tubercular patients in any way? States: No, 13. Cities: No, 6.

5. Do you disinfect premises occupied by tubercular patients after their removal or death? States: Yes, 2; no, 8; on request, 1; advised, 2. Cities: No, 1; on request, 4. One city renovates instead.

6. If disinfection is done what disinfectant do you advise? Formaldehyde, bichloride, sulphur, steam, boiling, carbolic acid, soap and water, fire, and renovation were all advised.

7. Are any steps taken to prevent tubercular children from attending school? State: Yes, 1; no, 8; advised, 1; occasionally, 3. Cities: Yes, 1; no, 5.

8. Are any steps taken to prevent tubercular teachers from teaching in public schools? State: Yes, 1; no, 8; advised, 1; occasionally, 3. Cities: No, 6.

9. Are any steps taken to prevent tubercular patients from acting in any capacity in the class known as personal service, — cooks, laundresses, household servants, barbers, physicians, midwives, nurses, etc.? States: No, 12; advised, 1. Cities: Yes, 1; no, 5.

NEW WORK.

The principal work done this year, coming under this head, has been directed to the study of agglutinative reactions, obtained from the blood of rabbits by inoculation with typhoid and colon bacilli. To Dr. A. A. Wheeler, a voluntary research worker in the laboratory, is due much painstaking and detail work on this subject. The results are as yet incomplete, and are not ready for publication. One point, which it is hoped to establish, is the practicability of using "colon rabbits" for the recognition of colon bacilli in public water supplies, ice, etc., using their blood to test isolated colonies showing colon characteristics.

A minor investigation of the possibility of substituting solutions of nutrose for milk in the ordinary bacteriological tests, depending on the coagulation or non-coagulation of casein, has been carried on with promising results so far.

Branching diphtheria bacilli have been found in about 10 per cent. of all positive cultures, and in about 5 per cent. of all positive cases.

The Appendix following contains tables showing the details of the routine work and deductions to be drawn therefrom. Reference to the report of 1898 will show the various circulars and forms in use by the laboratory, and in some cases fuller accounts of certain special topics.

All of which is respectfully submitted,

HIBBERT WINSLOW HILL, M.D.,
Director.

APPENDIX.

TABLE SUMMARIZING ROUTINE EXAMINATIONS.

DISEASE.	Number of Examinations.	
Diphtheria Cultures	7,930	The total diphtheria cultures for each year since examinations for the Boston Board of Health were begun were as follows: 1894, Diagnoses begun in November. 1895, 6,786 — Harvard Medical School. 1896, 7,255 — Harvard Medical School. 1897, 6,716 — Harvard Medical School. 1898, [1] 5,500 — Part at Harvard, part at this lab. 1899, 7,930 — Boston Board of Health lab. [1] This number is estimated. Diphtheria was unusually light during the year.
Swabs and 5 hrs...........	350	
Typhoid	483	
Glanders..................	65	
Malaria	19	
Influenza	3	
Rabies....................	2	
Septicæmia................	7	
Pus from various sources,	17	
Total.................	8,876	

Table No. 1. — Diphtheria.

WEEKLY TOTALS OF CULTURES EXAMINED.

	Total.	Primary Positive.	Primary Negative.	Primary No Growth.		Total.	Primary Positive	Primary Negative.	Primary No Growth.
Feb. 1 to Feb. 4..	54	4	35	......	May 20..	100	18	46	2
Feb. 11..	113	16	58	......	" 27..	134	13	55	6
" 18..	137	14	84	2	June 3..	117	14	44	4
" 25..	208	27	98	2	" 10..	97	13	48	2
March 4..	225	19	65	1	" 17..	75	14	34	1
" 11..	173	9	61	6	" 24..	109	30	41	......
" 18..	156	12	90	3	July 1..	122	18	49	2
" 25..	131	10	48	1	" 8..	104	24	31	1
April 1..	107	8	66	......	" 15..	117	9	26	1
" 8..	83	6	51	1	" 22..	85	11	19	1
" 15..	67	11	38	2	" 29..	100	18	24	......
" 22..	90	13	47	1	August 5..	124	21	28	1
" 29..	90	8	54	2	" 12..	107	17	34	1
May 6..	133	9	86	4	" 19..	96	5	37	4
" 13..	116	12	38	3	" 26..	89	7	37	1

Table No. I.—Diphtheria.—*Concluded.*

	Total.	Primary Positive.	Primary Negative.	Primary No Growth.		Total.	Primary Positive.	Primary Negative.	Primary No Growth.
September 2..	80	16	32	4	November 25..	176	39	73	4
" 9..	72	19	27	3	December 2..	224	43	99	1
" 16..	127	24	35	3	" 9..	259	31	123	......
" 23..	108	21	34	1	" 16..	249	24	99	4
" 30..	105	22	35	......	" 23..	258	58	97	......
October 7..	126	29	52	......	" 30..	240	37	101	......
" 14..	155	27	64	3	January 6..	245	34	103	......
" 21..	173	23	62	1	" 13..	259	37	109	1
" 28..	182	25	67	......	" 20..	290	39	112	1
November 4..	194	16	91	1	" 27..	294	38	120	1
" 11..	191	25	93	2	Jan. 28 to 31..	281	31	147	......
" 18..	192	24	108	5					

Table No. II.—Diphtheria.

SHOWING CULTURES CLASSIFIED.

Result of Examination.	Primary Total.	Primary for Diagnosis.	Primary for Release.	Secondary Total.	Secondary for Diagnosis.	Secondary for Release.	Total Cultures.	Total for Diagnosis.	Total for Release.
Positive ..	1,106	971	135	1,081	103	978	2,187	1,074	1,113
Negative..	3,340	2,962	378	2,256	276	1,980	5,596	3,238	2,358
No growth	90	77	13	57	19	38	147	96	51
Total....	4,536	4,010	526	3,394	398	2,996	7,930	4,408	3,522

Table No. III.—Diphtheria.

SHOWING CASES CLASSIFIED.

FINAL DIAGNOSIS OF CASES.	Cases Examined for Diagnosis.	Cases Examined for Release only.	Total.
Positive..........................	[1]1,019	168	1,187
Negative..........................	2,920	358	3,278
No growth........................	71	....	71
Total..............................	4,010	526	4,536

---

[1] Of the 1,019 positive cases for diagnosis, 476 were released by cultures in this laboratory. The remainder includes deaths, removals to hospital, etc. The total number of cases released by this laboratory was, therefore, 1,002.

Table No. IV. — Diphtheria.

SHOWING THE CULTURES ON ALL THE POSITIVE CASES FOR DIAGNOSIS, INCLUDING THOSE ON WHICH THE EARLIER EXAMINATIONS WERE NOT POSITIVE.

CULTURES.	No. of Cases.	Per Cent.
Positive result on first culture	971	95.3
Negative on first, positive on second	39	3.8
No growth on first, positive on second	6	0.6
Negative on first and second, positive on third	3	0.3
Total	1,019	100

Table No. V. — Diphtheria.

SHOWING COMPARISON BETWEEN CLINICAL DIAGNOSIS AND BACTERIOLOGICAL DIAGNOSIS.

CLINICAL DIAGNOSIS.	BACTERIOLOGICAL DIAGNOSIS.			
	Positive.	Negative.	No growth.	Total.
Positive	367	240	6	613
Negative	142	1,144	17	1,303
Doubtful	136	471	10	617
Total	645	1,855	33	2,533

THE SAME IN PERCENTAGES, OMITTING "NO GROWTHS."

CLINICAL DIAGNOSIS.	BACTERIOLOGICAL DIAGNOSIS.		
	Positive.	Negative.	Total.
Positive	60.5	39.5	100%
Negative	11.0	89.0	100%
Doubtful	22.4	77.6	100%

Actual concordance = 80%.
Theoretical concordance = 74.7%.

The theoretical concordance is the concordance to be expected, on the basis of the foregoing figures, if the number of positive clinical diagnoses equalled the number of negative clinical diagnoses.

It will be noted that the number of negative clinical diagnoses was greater than the number of clinical positive and clinical doubtful diagnoses together. Of the definite clinical diagnoses, nearly 60 per cent. were negative.

It will also be seen that the bacteriological results added 142 cases to the total diphtheria cases (as diagnosed by the physician), but subtracted 240 cases which would have been regarded as diphtheria if no culture had been made.

Table No. VI. — Diphtheria.

SHOWING CASES EXPOSED TO DIPHTHERIA, BUT WITHOUT ANY SYMPTOMS.

Bacteriological result, positive	4
Bacteriological result, negative	16
Total	20

Table No. VII.

SHOWING NEGATIVE CULTURES OBTAINED FOR RELEASE, INCLUDING PREMATURE NEGATIVES. ALL WERE RELEASED FINALLY BY TWO CONSECUTIVE NEGATIVES.

CASES RELEASED, SHOWING	Released without any Premature Negatives.	Showing one Premature Negative.	Showing two Separate Premature Negatives.	Showing three Separate Premature Negatives.	Showing two Consecutive Premature Negatives.	Showing three Consecutive Premature Negatives.	
Positive and Negative cultures	443	168	24	3	5	1	644
Negative only	358	......	......	......	......	......	358
	801	168	24	3	5	1	1,002

Therefore the 201 cases, released by two consecutive negatives, which showed one or more premature negatives before the final two consecutive negatives were obtained, constituted 31.2 per cent. of the total cases released on which a positive culture was obtained, and 20 per cent. of the total cases released.

Table No. VIII. — Diphtheria.

SHOWING NUMBER OF "CULTURES REQUESTED."

When a culture for diagnosis proved negative, if the clinical diagnosis was diphtheria, or if membrane was present on the pharynx, or if an organism resembling but not identical with the diphtheria bacillus was found, and in all cases when the culture showed "no growth" (including contaminations), another culture was requested.

	Positive.	Negative.	No growth.
Total responses 124	39	83	2
No response 299	....	....	....
Total cultures requested 423	....	....	....

About 30 per cent. of the requests were responded to.

About 30 per cent. of the responses, or about 11 per cent. of the requested cultures, were positive.

Table No. IX. — Diphtheria.

COMPARATIVE RESULTS FROM SWAB, FIVE-HOUR AND FIFTEEN-HOUR EXAMINATIONS.

(These results include only examinations from September 1, 1899, to January 31, 1900, or five months' work.)

A.

Swab Examinations Compared with Five-hour Incubations.

SWABS.	FIVE-HOUR INCUBATION.				Total.
	Positive.	Negative.	Doubtful.	Unsatisfactory.	
Positive	22	1	....	2	25
Negative	3	64	3	6	76
Doubtful	4	2	....	4	10
Unsatisfactory	....	2	1	....	3
Total	29	69	4	12	114

Thus, 75 per cent. of cultures which proved positive after five-hour incubation had been detected as positive from the swab examination. Three swabs were positive on which the five-hour incubations were negative or unsatisfactory.

The swab examination saved on an average five hours on each case, as compared with the five-hour incubation, or a total of 110 hours.

B.

Swab Examinations Compared with Fifteen-hour Incubations.

SWABS.	FIFTEEN-HOUR INCUBATION.			Total.
	Positive.	Negative.	No growth (unsatisfactory).	
Positive	40	*3	....	43
Negative	21	101	1	123
Doubtful	10	6	....	16
Unsatisfactory	....	7	....	7
Total	71	117	1	189

Thus 56 per cent. of cultures which proved positive after fifteen-hour incubation had been detected as positive from the swab examination.

* Three swabs were positive on which the fifteen-hour incubations were negative. Subsequent cultures confirmed the swab result in two cases. In the third, no subsequent cultures were received.

Of the cultures finally proving negative on fifteen-hour incubation, 88 per cent. had been detected as negative on swab examination.

The swab examinations saved from fifteen to twenty-four hours on each case as compared with the over-night, or fifteen-hour incubation, a total of 600 to 960 hours.

C.

Five-hour Incubations Compared with Fifteen-hour Incubations.

FIVE-HOUR INCUBATION.	FIFTEEN-HOUR INCUBATION.			Total.
	Positive.	Negative.	No growth (unsatisfactory).	
Positive	27	2	....	29
Negative	8	76	....	84
Doubtful	7	7	....	14
Unsatisfactory	1	5	1	7
Total	43	90	1	134

Thus 63 per cent. of cultures which proved positive after fifteen-hour incubation had been detected as positive from the five-hour incubation.

Two five-hour incubations were positive on which the fifteen-hour incubations were negative.

The five-hour incubation saved on an average ten hours on each case as compared with the fifteen-hour incubations; a total of 270 hours.

Table No. I. — Typhoid.

MONTHLY TOTALS OF WIDAL REACTIONS.

	Pos.	Neg.	Atyp.		Pos.	Neg.	Atyp.
1899. February	2	6	....	1899. August	11	36	5
March	1	6	2	September	25	38	8
April	20	15	....	October	37	54	3
May	8	13	3	November	6	46	3
June	4	13	1	December	12	29	4
July	2	33	2	1900. January	4	29	2

Table No. II. — Typhoid.

SHOWING TOTAL WIDAL TESTS.

Positive.	Negative.	Unsatisfactory.	Total.
132	318	33	483

Table No. III. — Typhoid.

SHOWING CASES CLASSIFIED.

Positive.	Negative.	Unsatisfactory.	Total.
128	259	25	412

Table No. IV. — Typhoid.

SHOWING ALL POSITIVE CASES, INCLUDING THOSE ON WHICH THE EARLIER EXAMINATIONS WERE NOT POSITIVE.

	Number of Cases.	Percentage.
Positive on first preparation	108	84.4
Positive on second preparation after one negative	13	10.1
Positive on second preparation after one atypical	3	2.3
Positive on third preparation after one atypical and one negative	2	—
Positive on fourth preparation after three negatives	1	—
Positive on fourth preparation after one atypical, one negative and one atypical	1	—
Total	128	—

Table No. V. — Typhoid.

SHOWING CLINICAL DIAGNOSIS IN CASES YIELDING POSITIVE WIDAL REACTION.

	Cases.
Bacteriological diagnosis, positive	128
Clinical diagnosis, positive	71
" " negative	3
" " doubtful	40
" " not given	14
	128

Table No. VI. — Typhoid.

SHOWING TIME IN WHICH THE WIDAL REACTION DEVELOPED IN THOSE EXAMINATIONS WHICH PROVED POSITIVE.

Dilution. — One part of blood with ten of sterile water: one drop of this with one drop of typhoid broth culture, or approximately a dilution of one in twenty.
Time of observation — one hour.

Agglutination and Loss of Motility occurred in

Number of minutes	5	10	15	20	25	30	35	40	45	60	90
Number of preparations	6	13	4	5	1	22	1	4	1	58	3

In six cases motility was not completely lost. It is probable that the reaction developed earlier than sixty minutes in many of the fifty-eight given above as requiring this time. In all cases the reaction began to develop much earlier than the figures given, which indicate the time required for the completion of the test.

Table No. VII. — Typhoid.

SHOWING ATYPICAL RESULTS, AND SUBSEQUENT EXAMINATIONS.

TESTS SHOWING		Number of Tests.	SUBSEQUENT EXAMINATIONS.	
Agglutination.	Loss of Motility.		Positive.	Negative.
+	−	13	3	0
−	+	9	4	0
Partial.	Partial.	6	2	1

Table No. VIII. — Typhoid.

SHOWING RELATION OF ENLARGED SPLEEN AND PRESENCE OF ROSE SPOTS TO POSITIVE RESULTS.

Spleen Enlarged.	Rose Spots.	Positive Results.
+	+	37
−	−	27
+	−	18
−	+	14
+	?	4
−	?	4
?	+	4
?	−	4
		112

Table No. IX. — Typhoid.

SHOWING DAY OF DISEASE OF WHICH POSITIVE RESULTS WERE OBTAINED.

		POSITIVE ON FIRST EXAMINATION.	POSITIVE ON SECOND EXAMINATION.	POSITIVE ON THIRD EXAMINATION.	POSITIVE ON FOURTH EXAMINATION.
		Number of Cases.	Number of Cases.	Number of Cases.	Number of Cases.
Days	3	2			
Days	4	3			
Days	5	6			
Days	6	8	1		
Days	7	13			
Days	8	10	1		
Days	9	11	1		
Days	10	8	1		

Table IX. — Typhoid. — *Concluded.*

		POSITIVE ON FIRST EXAMINATION.	POSITIVE ON SECOND EXAMINATION.	POSITIVE ON THIRD EXAMINATION.	POSITIVE ON FOURTH EXAMINATION.
		Number of Cases.	Number of Cases.	Number of Cases.	Number of Cases
Days..........	11	6	....	....	....
Days..........	12	4	2	....	....
Days..........	13	4	....	....	....
Days..........	14	6	1	....	....
Days..........	15	3	....	....	....
Days..........	16	1	....	....	....
Days..........	17	2	....	....	....
Days..........	18	....	2	....	1
Days..........	19	2	....	....	....
Days	20	3	1	....	....
Days...... ...	21	5	....	....	....
Days..........	24	1	....	1	....
Days...	25	1	....	....	....
Days...	26	1	1	....	....
Days..........	27	1	....	....	....
Days..........	30	1	....	....	....
Days..........	32	1	....	....	....
Days..........	35	1	1	....	....

Table No. I. — Glanders.

MONTHLY TOTALS OF GUINEA-PIG TESTS.

		Positive.	Negative.	Unsatisfactory.
1899.	February	2	2	2
	March	1	....	1
	April	1	1	....
	May	2	3	1
	June..................	2	3	2
	July	3	....	1
	August	3	1	1
	September	1	2	....
	October...............	....	3	2
	November	2	2	4
	December	1	....	1
1900	January	8	5	2

Table No. II. — Glanders.

SHOWING TOTAL GUINEA-PIG TESTS.

Positive.	Negative.	Unsatisfactory.	Total.
26	22	17	65

Table No. III. — Glanders.

SHOWING CASES CLASSIFIED ON RESULTS OF GUINEA-PIG TESTS.

	Positive.	Negative.	Unsat.	Total.	In Boston.	Outside.
Total cases tested....	23	14	9*	46	41	5

* Five of these nine unsatisfactory cases later proved to be glanders clinically.

Table No. IV. — Glanders.

SHOWING ALL POSITIVE CASES, INCLUDING THOSE ON WHICH THE EARLIER GUINEA-PIG TESTS WERE NOT POSITIVE.

Positive on 1st test	20	71.4 %
Positive on 2d test (1st test unsatisfactory)	2	7.1 %
Positive on 3d test (1st test unsatisfactory, 2d test negative).	1	3.6 %
Final clinical diagnosis positive; tests unsatisfactory	5	17.9 %
Total positive cases	28	

NOTE. — Fourteen negative and four unsatisfactory cases failed to show glanders clinically subsequently.

Table No. V. — Glanders.

SHOWING COMPARISON BETWEEN CLINICAL DIAGNOSIS AND GUINEA-PIG TEST.

CLINICAL DIAGNOSIS (IN HORSE).	GUINEA-PIG TEST.			
	Pos.	Neg.	Unsat.	Total.
Positive	11	2	*5	18
Negative	1	4	2	7
Doubtful	12	8	1	21
Total	24	14	8	46

Hence 57 per cent. of those cases which the attending veterinarian could not decide from clinical evidence at the time were shown to be glanders by the guinea-pig test. These cases, in the absence of the guinea-pig test, would have remained amongst other horses until typical clinical symptoms developed, acting as sources of infection in the interim.

*Clinical evidence of glanders developed later in these five cases.

Table No. VI. — Glanders.

SHOWING TIME OCCUPIED IN GUINEA-PIG TESTS.

	1 day.	2 days.	3 days.	4 days.	5 days.	6 days.	7 days.
Number of guinea-pigs, showing intervals stated between inoculation and development of typical symptoms..............	2	7	7	3	3	1	1

Table No. VII. — Glanders.

SHOWING TIME OF DEATH OF GUINEA-PIGS AFTER INOCULATION IN THOSE CASES WHERE DEATH OCCURRED FROM PERITONITIS.

Number of guinea-pigs dying of Peritonitis.	DEATH OCCURRED IN		
	One Day.	Two Days.	Three Days.
17	14	2	1

Table No. VIII. — Glanders.

SHOWING COMPARISON BETWEEN MALLEIN TEST AND GUINEA-PIG TEST.

MALLEIN TEST.	GUINEA-PIG TEST.			
	Pos.	Neg.	Unsat.	Total.
Positive................................	11	2	*3	16
Negative.............	0	3	1	4
Unsatisfactory	1	1	0	2
Total................................	12	6	4	22

* Clinical evidence later showed these three cases to be glanders.

Table No. IX. — Glanders.

SHOWING LESIONS FROM WHICH GUINEA-PIG TESTS WERE MADE.

	Pos.	Neg.	Unsat.	Total.
Nasal discharge..	11	8	9	28
Ulcers on leg..	10	6	....	16
Ulcers on thorax......................................	1	1	....	2
Ulcers on neck...	....	2	....	2
Nodule on tail...	....	1	....	1
Lymphatic gland of leg.............................	....	1	....	*1
Deposit in lung.......................................	1	....	....	*1

* Same horse; autopsy.

Table No. X. — Glanders.

SHOWING GUINEA-PIG TESTS FROM DIFFERENT LESIONS IN SAME HORSE.

		Result.			Result.			Result.			Result.
1	Neck	—	2	Nose	+	3	Nose	+	4	Leg	—
	Leg	—		Leg	—		Leg	—		* Lymphatic gland in leg	—
										* Deposit in lung	+

* Autopsy.

REPORT OF MEDICAL INSPECTOR.

Boston, Mass., January 1, 1900.

To the Board of Health:

Gentlemen, — I have the honor to submit the following report for the year ending December 31, 1899:

During the past year, *four hundred and thirty-seven* persons dying without a physician in attendance have been reported to this office. In all these cases a personal visit has been made, the body examined, and a probable diagnosis made before granting a permit for burial.

Fourteen cases have been referred to the Medical Examiner for investigation.

A tabular statement of the cases investigated is appended.

Infectious Diseases.

Forty cases of eruptive diseases reported as small-pox have been examined during the year. Twenty-eight of these were found to be small-pox.

The first case was reported January 30, 1899, in a female that had arrived in the city a few days previously from Norfolk, Va., where the disease at that time was prevalent. The city was free until April 11, 1899, when a convalescent case was discovered in the Charlestown District, and in the next two weeks eight cases were found and traced to this source of infection.

June 7, 1899. Two children were found in South Boston in the "last stages" of the disease. The family had lately removed from New Hampshire, and had contracted the disease before their arrival in Boston. Six cases were traced to this infection.

August 4, 1899. A patient applied for treatment at one of the hospitals, and was found to be suffering with small-pox. The disease was traced to a neighboring city.

August 12, 1899. A patient was found in one of the hospitals of the city with a mild type of the disease. Source of infection could not be traced.

In the month of December five cases were found in East Boston. The original source of infection was never traced satisfactorily, although strong suspicion existed that the exposure was in a neighboring city where the disease at that time was prevalent.

These several outbreaks were handled as is customary by the department, viz., removal of patient to the hospital; thorough disinfection; vaccination and revaccination of all persons that have been in contact or exposed to patient; surveillance of suspects for two weeks, and a daily visit made until all danger has been removed.

Of these cases, numbering twenty-eight, there were four deaths — three at quarantine and one at the Detention Hospital. Eighteen cases were treated at the Quarantine Hospital.

The Small-pox Hospital on Canterbury street was transferred early in the year to the Trustees of Austin Farm, and the hospital on Sweet street fitted up and made ready for persons suffering with this disease, and known as the Detention Hospital. This hospital is of modern construction and equipment and ready at all times to receive patients. One great advantage is the central location of this hospital. Patients can be easily and quickly removed from all parts of the city and with very little discomfort. A new ambulance for the removal of small-pox patients was obtained during the year.

Two thousand eight hundred and thirty-six cases of diphtheria and one thousand three hundred and eighty-one cases of scarlet fever were reported the past year. Each case has been investigated, and a report made whether or not the case was properly isolated. In many cases isolation was not approved, and these cases were sent to the hospital, and when necessary an order was obtained for a forcible removal.

Respectfully submitted,

THOMAS B. SHEA, M.D.

Tabular Statement of the Cause of Deaths Investigated by Physician to the Board of Health for the Year ending Dec. 31, 1899.

DISEASES.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
I. Zymotics.													
Cerebro-spinal fever	....	....	....	....	....	....	2	....	....	....	....	....	2
Cholera infantum	....	....	....	....	....	....	12	3	1	....	....	....	16
Cholera morbus	....	....	....	....	....	....	1	....	....	....	....	....	1
Diphtheria	....	1	1	....	....	....	1	....	....	....	1	....	4
Measles	....	....	....	....	....	....	....	....	....	....	....	....	....
Whooping-cough	1	2	....	....	1	....	....	....	....	....	....	....	4
Other Zymotic diseases	....	....	....	...	....	....	....	3	....	....	....	....	3
II. Constitutional.													
Cancer	....	....	1	....	....	1	1	....	....	1	....	....	4
Marasmus	....	....	1	2	1	....	....	3	....	1	2	....	10
Phthisis pulmonalis	....	2	2	3	7	2	1	2	1	2	1	1	24
Tubercular meningitis	....	....	....	2	1	1	....	....	....	....	....	....	4
Tuberculosis	..	1	....	2	1	5	3	1	3	2	....	1	19
Other constitutional diseases,	....	....	....	1	....	1	....	....	....	....	....	....	2
III. Local.													
Apoplexy	6	2	2	3	4	1	2	3	....	2	1	4	30
Bronchitis	2	1	1	1	....	1	....	1	....	3	3	....	13
Bright's disease	....	....	1	....	....	....	....	....	....	....	1	....	2
Enteritis	....	....	...	....	....	....	....	1	....	....	....	....	1
Gastro-enteritis	....	....	2	....	....	....	5	2	2	1	....	....	12
Heart disease	7	7	6	7	4	8	2	4	7	2	10	7	71
Meningitis	1	..	1	....	....	1	2	....	....	....	....	....	5
Nephritis	1	1	....	....	....	....	1	....	....	....	....	....	3
Pneumonia	10	8	4	3	1	2	1	1	....	1	2	4	37
Other local diseases	4	1	2	1	1	1	5	1	3	3	2	1	25
IV. Developmental.													
Inanition	3	....	....	4	1	....	6	4	1	....	2	2	23
Old age	4	....	1	...	2	1	....	1	....	3	....	3	15
Premature birth	2	1	....	1	....	4	1	1	3	2	2	1	18
Other developmental diseases	....	....	....	....	2	....	....	....	1	....	....	....	3
Carried forward	32	26	24	25	21	24	39	25	17	18	23	18	292

STATEMENT OF THE CAUSE OF DEATHS.— *Concluded.*

DISEASES.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
Brought forward	32	26	24	25	21	24	39	25	17	18	23	18	292
V. Violent.													
Accidental	....	....	....	....	....	....	....	....	....	....	1	1	2
Accidental overlaid	....	1	....	....	....	1	....	....	....	....	....	....	2
Unknown	7	6	2	3	5	4	2	4	3	4	5	4	49
Still-births	....	....	1	....	2	....	....	2	3	2	5	4	19
Referred to Medical Examiner	2	....	1	2	....	1	1	2	....	2	2	1	14
Total	50	34	29	35	33	35	49	39	28	31	40	34	437

REPORT OF GEORGE A. SARGENT, M.D.

January 1, 1900.

To the Board of Health:

GENTLEMEN, — I have the honor to submit the following report:

During the past year 3,251 persons have been vaccinated, and 1,174 certificates of vaccination have been issued. The City Prison has been visited on Saturdays and holidays throughout the year, and at this institution have been treated the following injuries and diseases:

Abrasions, contusions, delirium tremens, dislocations, fractures, sprains, incised wounds, lacerated wounds, scalp wounds. Suffolk County Jail: Seventeen hundred and one patients have been treated, requiring 3,338 visits. Five deaths have occurred, one from pneumonia, two from cerebral hemorrhage, and two from heart disease. Six patients have been sent to the hospital, and one has been sent to the Insane Asylum. A tabular list of the cases treated at the Jail is appended.

The Chardon-street Home has been visited, and cases have been treated of anæmia, acute and chronic bronchitis, constipation, debility, dementia, neuralgia, pharyngitis, phthisis, rheumatism, syphilis, tonsillitis.

Respectfully submitted,

GEORGE A. SARGENT, M.D.

Tabular Statement of the Diseases Treated at Suffolk County Jail for the Year ending December 31, 1899.

DISEASES.	Remaining Jan. 1, 1899.	Treated during year.	Recovered.	Improved.	Sent to Hospital.	Sent to Insane Asylum.	Discharged from custody.	Deaths.	Remaining Dec. 31, 1899.
General Diseases:									
Anæmia	....	9	......	9	....	....	....	....	....
Debility	....	34	......	34	....	....	....	....	....
Febricula	....	52	52	......	....	....	....	....	....
Fever, intermittent	....	4	4	......	....	....	....	....	....
Marasmus	....	1	......	......	....	....	1	....	....
Phthisis pulmonalis	....	6	......	......	....	....	6	....	....
Rheumatism, acute	....	13	13	......	....	....	....	....	....
Rheumatism, chronic	....	84	......	84	....	....	....	....	....
Functional Diseases of Nervous System:									
Delirium tremens	....	132	132	......	....	....	....	....	....
Epilepsy	....	1	......	1	....	....	....	....	....
Neuralgia	....	110	50	60	....	....	....	....	....
Diseases of the Intellect:									
Dementia	....	1	......	......	....	1	....	....	....
Diseases of Circulatory System:									
Cerebral Hemorrhage	....	2	......	......	....	....	....	2	....
Diseases of the Heart:									
Functional Diseases of Heart	....	2	......	2	....	....	....	....	....
Organic Diseases of Heart:									
Endocarditis	....	5	......	2	1	....	....	2	....
Myocarditis	....	1	......	......	....	....	1	....	....
Diseases of Bronchi:									
Asthma	....	1	......	1	....	....	....	....	....
Bronchitis, acute	....	55	55	......	....	....	....	....	....
Bronchitis, chronic	....	2	......	2	....	....	....	....	....
Diseases of Lungs:									
Pleurisy	....	3	......	3	....	....	....	....	....
Pneumonia	....	5	2	......	2	....	....	1	....
Carried forward	....	523	308	198	3	1	8	5	....

STATEMENT OF THE DISEASES TREATED. — *Continued.*

Diseases.	Remaining Jan. 1, 1899.	Treated during year.	Recovered.	Improved.	Sent to Hospital.	Sent to Insane Asylum.	Discharged from custody.	Deaths.	Remaining Dec. 31, 1899.
Brought forward	....	523	308	198	3	1	8	5	....
Diseases of Fauces:									
Pharyngitis	....	13	13	......	....	....	....	....	....
Post Nasal Catarrh	....	2	......	2	....	....	....	....	....
Tonsillitis, follicular	....	7	7	......	....	....	....	....	....
Diseases of Digestive System:									
Colic	....	9	9	......	....	....	....	....	....
Constipation	....	456	456	......	...	....	....	....	....
Diarrhœa	....	137	137	......	....	....	....	....	....
Dyspepsia	....	49	......	49	....	....	....	....	....
Functional Diseases of Women:									
Menorrhagia	....	2	......	2	....	....	....	....	....
Pregnancy	....	4	2	......	1	....	1	....	....
Diseases of Cutaneous System:									
Dermatitis	....	8	8	......	....	....	....	....	....
Eczema	....	11	......	11	....	....	....	....	....
Furuncle	....	7	7	......	....	....	....	...	....
Herpes	....	6	6	......	....	....	....	....	....
Ichthyosis	....	1	......	......	....	....	1	....	....
Paronychia	....	2	2	......	....	....	....	....	....
Phthiriasis	...	31	31	......	....	....	....	....	....
Scabies	....	8	8	......	....	....	....	....	....
Seborrhœa	....	1	......	1	....	....	....	...	....
Sycosis	....	1	1	......	....	....	....	....	....
Tinea	....	2	2	......	....	....	....	....	....
Verucca	....	1	1	......	....	...	....	....	....
Diseases of Eye:									
Conjunctivitis	....	11	11	......	....	....	...	....	....
Iritis	....	1	......	1	....	....	....	....	....
Poisons:									
Coca habit	....	1	......	......	....	....	1	....	....
Lead poisoning	....	1	......	1	....	....	....	....	....
Opium habit	....	14	......	8	....	...	6	....	....
Carried forward	....	1,309	1,009	273	4	1	17	5	....

STATEMENT OF THE DISEASES AT SUFFOLK COUNTY JAIL. — *Concluded.*

DISEASES.	Remaining Jan. 1, 1899.	Treated during year.	Recovered.	Improved.	Sent to Hospital.	Sent to Insane Asylum.	Discharged from custody.	Deaths.	Remaining Dec. 31, 1899.
Brought forward	....	1,309	1,009	273	4	1	17	5	....
Surgical Diseases:									
Abscess	1	16	17	......	....	....	....	....	....
Adenitis	....	3	......	......	....	....	3	....	....
Chancroid	....	3	......	3	....	....	....	....	....
Chronic Ulcer	....	2	......	2	....	....	....	....	....
Gonorrhœa	2	66	35	30	....	....	....	....	3
Hemorrhoids	....	3	......	3	....	....	....	....	....
Hernia	....	2	......	2	....	....	....	....	....
Hydrocele	....	2	......	1	....	....	1	....	....
Leucorrhœa	....	3	......	3	....	....	....	....	....
Orchitis	...	2	1	......	....	....	1	....	....
Otitis	....	12	12	......	....	....	....	....	....
Syphilis	3	42	......	40	....	....	....	....	5
Injuries:									
Abrasions	....	65	65	......	....	....	....	....	....
Burns	....	4	4	......	....	....	....	....	....
Contusions	....	21	21	......	....	....	....	....	....
Fractures	....	3	......	......	1	....	2	....	....
Gangrene (after frost bite)	....	1	......	......	1	....	....	....	....
Sprains	....	4	4	......	....	....	....	....	....
Wounds:									
Incised	....	19	12	......	....	....	7	....	....
Lacerated	....	13	10	......	....	....	3	....	....
Scalp	....	50	45	......	....	....	5	....	....
Total	6	1,645	1,235	357	6	1	39	5	8
Malingering	....	50	......	......	....	....	....	....	....
Grand Total	6	1,695	1,235	357	6	1	39	5	8

QUARANTINE DEPARTMENT, CITY OF BOSTON.

Board of Health:

GENTLEMEN,—I herewith submit a report of the Quarantine Department for the year ending December 31, 1899. During the past year all vessels from foreign ports, with the exception of those from the British Maritime Provinces, have been inspected, and from June 1 to November 1 all vessels from domestic ports south of Virginia were inspected. From August 2 to August 12, owing to a slight epidemic of yellow fever at and in the immediate vicinity of Hampton, Va., all vessels from ports on the Chesapeake and Virginia were inspected July 2. S.S. "Olario," from Hull, arrived at quarantine with a case of small-pox on board. The case was removed, and vessel and crew treated in accordance with United States regulations.

July 16, S.S. "Parran," bound for Southern ports, was disinfected at the request of the vessel's agents.

The hospital report is as follows:

	Remaining in Hospital Jan. 1, 1900.	Total during year.	Discharged well.	Died.
Small-pox		20	16	4
Measles		6	5	1
Scarlet Fever		1	1	
Diphtheria		1		1
Observation		6	6	

During the year, 896 vessels paid fees at this port, classified as follows:

Steamers	665
Schooners	143
Barks	53
Ships	22
Brigs	13
	896

In addition to the foregoing, sixteen steamers, three schooners, and two brigs, whose papers showed that they had paid fees elsewhere, were inspected and passed and no fee charged. Twenty-four thousand and twenty seamen, 4,140 cattlemen, and 28,264 passengers were inspected.

Vessels, 500 tons and over, 759, at $8	$6,072 00
" under 500 tons....137, at $5	685 00
896	
Disinfection	30 00
	$6,787 00

The hospitals and detention-houses are all in good condition. The bath-house and wharf that suffered so severely from the November gale have been entirely repaired, and at the present time a stone wall is being built to protect the eastern portion of the island from the elements.

June 1, 1899, Mr. Wm. F. Clark, after two years of valuable service as overseer, resigned to accept the Deputy Superintendency of Long Island. Mr. Albert F. Sherman succeeded him; otherwise the *personnel* of the department remains the same.

Respectfully,
PAUL CARSON.

REPORT OF INSPECTOR OF ANIMALS.

BOSTON, January 1, 1899.

To the Board of Health:

GENTLEMEN, — I have the honor to submit the following report of the inspection of animals and dressed meat at the Brighton abattoir, and animals kept for the production of milk within the city, for the year ending December 31, 1898:

ANIMALS KILLED AT ABATTOIR.

Cattle	18,162
Calves	21,830
Sheep	16,169
Swine	57
Total	56,218

ANIMALS CONDEMNED.

	Number.	Weight.
Cows	126	47,148
Steers	1	850
Bulls		
Calves		
Sheep	1	52
Swine		
Parts of animals, including 539 livers		10,000
Total	128	58,050

Many of the smaller animals, as sheep, calves and swine, arrive at the slaughter-houses dead, and are at once prepared for rendering by the owners; such cases are not considered as seizures, and are not included in the table of animals seized and condemned.

"Parts of animals," in the above table, refers to animals where only a part of the same was condemned; the unmarketable portions being confined to the parts about the lesion, which in these cases are simply of a local condition, as a liver, heart, tongue, and fore or hindquarter of an injured or bruised animal.

Diseases found among animals after having been killed and dressed at the abattoir, necessitating the condemning of the carcasses:

DISEASES.	Cattle.	Calves.	Sheep.	Swine.
Tuberculosis	120	....	....	....
Septicæmia	5	....	1	....
Abdominal abscess	1	....	....	....
Total	126	....	1	....

Animals received dead from the stock-yards to be dressed for food:

ANIMALS.	Number Received.	Number Condemned.	Weight.
Cows	25	6	2,275
Bulls	4	....	....
Steers	20	....	....
Swine	....	....	....
Total	49	6	2,275

The above table refers to animals arriving at the different stock-yards which, from injury during transportation or from what was supposed to be a slight illness, were unable to walk to the abattoir; these were shot at the stock-yards, and carted to the abattoir in the ambulance.

Of the above forty-nine animals, thirty-seven were found to be slightly injured, two were pregnant, three had laminitis, one was wild, five had septicæmia, and one had tuberculosis, the last six being condemned.

TUBERCULOSIS.

The following table shows the percentage of tuberculosis in cattle killed at the abattoir:

CLASS OF ANIMALS.	Number Received.	Tuberculosis.	Percentage.
Whole number of all kinds	18,162	234	1.28
Cows from Eastern States	3,936	232	5.89
Bulls from Eastern States	918	1	0.10
Cows from Western States	1,387		
Bulls from Western States	323		
Steers from Western States	11,598		
Steers from Eastern States		1	

Under the head of "Cows from Eastern States" is understood those animals from all of the New England States, including Massachusetts.

By comparison of the above table, with table under the head of "Diseases found among animals after having been killed," etc., it will be seen that only 120 of the 234 cases of tuberculosis were condemned. This means that 114 of these cases were slight and not condemnable under the act passed by the Legislature of 1898.

The increase in the actual number of tuberculous cows found at the abattoir during the past year is probably due to the two following reasons:

First, the great increase in number (3,936) of cows killed during the past year as compared with the number (1,506) killed during the year 1898.

Second, the State Board of Cattle Commissioners have killed a large number of tuberculous cows at the abattoir, condemned throughout the State.

After deducting, from the whole number of tuberculous cows killed, the number ordered killed by the Cattle Commissioners, which in all probability would not have reached the abattoir under ordinary conditions, the percentage (4.06) of tuberculous cows for the year 1899 compares favorably with the percentage (3.187) for the year 1898.

INSPECTION OF CATTLE.

The inspection of cattle kept for the production of milk within the city limits has been continued as heretofore. All cattle that have, upon physical examination, shown any symptoms of tuberculosis have been subjected to the tuberculin test.

Nine animals have been tested with tuberculin; six were found tuberculous, and were quarantined. These were at once reported to the Board of Cattle Commissioners in accordance with the Public Statutes.

Upon examination of the various dairies within the city it has been noticed that considerable improvements have been made in the conditions of milk-rooms, as a result of the regulations of the Board of Health in regard to the milk business, passed during the year 1898.

There are still quite a number of dairies which have either not provided proper milk-rooms, or, having the same, have not been kept in a proper condition, and to the owners of which it would be advisable to refuse a milk license for the year 1900 until such conditions as the regulations require have been complied with.

GLANDERS.

There have been reported by veterinarians to the Board of Health during the past year 148 horses under the suspicion of having glanders. Of these, sixteen, on examination, were found to be affected with some other non-contagious disease, and the remaining 132 proved to have glanders. Twenty of these cases, upon inquiry, were found to have been owned and stabled outside of Boston, or had been stabled in Boston for so short a time that no doubt existed but that the animals were infected with glanders before coming to Boston. The cities and towns from which such animals came were notified, thus enabling them to investigate the cases.

In addition to the above cases of glanders reported to this office, the Board of Health, by examination of all animals in stables where a case of glanders has occurred, and also many other stables, have found twenty-five other cases of glanders, or 18.23 per cent. of the total number of cases, all of which would have remained in such stables, a constant danger to the other animals, for some time before being discovered by the owner.

During such stable inspections 3,110 horses have been examined. It is necessary to make such examinations on Sundays only, as at no other time is it possible to find all animals in.

The following table shows the number of cases of glanders for each month during the past year :

MONTH.	Cases reported.	Cases found by Board of Health.	Cases found which belonged in some other city.	Cases which, upon examination, were found not to be glanders.	Actual number of cases of glanders found in city.	Number of cases of glanders which belonged in Boston.	Number of stables in which glanders was found.
January........	7	2	....	1	8	8	7
February.......	15	3	....	1	17	17	14
March..........	11	1	....	3	9	9	9
April...........	11	2	3	....	13	10	13
May.............	8	5	....	2	11	11	9
June............	7	....	....	1	6	6	5
July............	11	1	4	....	12	8	11
August........	13	....	3	1	12	9	15
September......	17	2	2	....	19	17	21
October.........	22	1	1	4	19	18	20
November......	13	3	3	2	14	11	13
December.......	13	5	4	1	17	13	16
Total.........	148	25	20	16	157	137	153

All stables in which glanders have occurred during the past year have been thoroughly disinfected.

Mallein has been used by this department to a considerable extent, particularly in such cases as were doubtful from a clinical standpoint, and where material for guinea-pig test was not available, as, for instance, where the only lesion to be discovered clinically was an enlarged submaxillary gland with no nasal discharge. Where it has been possible, all horses which have been associated with another animal having glanders, as, for instance, a mate working in the same team with a glandered horse, have been subjected to the mallein test. In such cases where no symptoms are present and a reaction is made to mallein, such horses have been kept under strict observation by the Board of Health.

Such varied opinions have been expressed by different authorities in regard to the value of mallein as a diagnostic agent, it has been thought well to tabulate the last one hundred cases as showing the actual results obtained in practice.

The following table shows, in a condensed form, the relation of the mallein test to the clinical diagnosis at the time of making the mallein test, and to the final diagnosis based on autopsy, guinea-pig test, or prolonged observations:

1.		2.	3.		4.	5.		6.	7.	
CLINICAL DIAGNOSIS.	Totals.	Mallein result positive.	Final clinical diagnosis on positive mallein tests.		Mallein result negative.	Final clinical diagnosis on negative mallein tests.		Mallein result doubtful.	Final clinical diagnosis on doubtful mallein tests.	
			Pos.	Neg.		Pos.	Neg.		Pos.	Neg.
Positive..	38	36	36	....	......	....	....	2	2	....
Negative..	31	4	2	2	25	....	25	2	....	2
Doubtful..	31	25	20	5	2	....	2	4	2	2
	100	65	58	7	27	....	27	8	4	4

Column 1 shows the one hundred cases divided into positive, negative, and doubtful on clinical diagnosis.

Column 2 shows the number positive mallein tests obtained from each of these divisions.

Column 3 shows the final diagnosis of the animal, giving positive mallein test.

Columns 4 and 6 give similarly the negative and doubtful mallein results.

Columns 5 and 7 show the final diagnosis on these respectively.

The conclusions drawn from this table are as follows:

1. All animals, whether suspected of glanders or not, failing to react to the mallein test, may be considered free from glanders. (See columns 4 and 5.)

2. Animals, whether suspected of glanders or not, reacting to the mallein test, may or may not be affected with glanders. (See columns 2 and 3.) It will be seen, however, that 89 per cent. of the animals reacting to the mallein test, are affected with glanders.

3. Animals giving a doubtful reaction to the mallein test may or may not be affected with glanders. (See columns 6 and 7.)

Attention is called to the fact that the conclusions are drawn as a result of the above one hundred cases.

The results of the mallein tests have been classed as doubtful in the above table when the temperature before testing was 102 or less, and the temperature during the test failed to reach 104. If the temperature before testing was above 102, the mallein test is also considered doubtful unless a rise of two degrees or more occurs during the test.

Rabies.

During the past year four dogs suspected of having rabies have been reported to this office, all of which upon examination proved not to be rabies.

The following statute was passed by the Legislature of 1898:

> Section 1. Any owner, agent, or other person in charge of or called to examine an animal in the city of Boston affected with either of the diseases known as glanders, farcy, or rabies, shall forthwith report to the Board of Health of said city the name of the owner and place of keeping of such animal.
>
> Sect. 2. Every owner or person, having charge of an animal in said city, shall permit any health commissioner or health inspector of said city to examine such animal from time to time, and for that purpose to enter upon any premises upon which the animal is kept. The Board of Health of said city, when convinced that any animal is affected with either of the diseases aforesaid, shall notify the owner or person having charge of the animal to permit the animal to be killed or otherwise disposed of. Any health inspector of said city, who is also a doctor of veterinary medicine, when of the opinion that any animal within said city is affected with or has been exposed to infection from any animal having either of said diseases, shall notify the owner or person having the charge of such animal to isolate such animal in such manner as the Board of Health of said city shall prescribe, or to permit such animal to be taken and isolated by said Board.
>
> Sect. 3. Any person violating any provision of this act shall for each offence be punished by a fine not exceeding one hundred dollars or by imprisonment in the House of Correction not exceeding one year.

The above statute will assist considerably in handling epidemics of rabies, because under it the Board of Health has the authority to remove all dogs suspicious of rabies, or even exposed to infection, to the quarantine station provided for such cases.

Respectfully submitted,

Alexander Burr, M.D.V.

Inspector and Veterinarian.

REPORT OF THE INSPECTOR OF MILK AND VINEGAR.

BUREAU OF MILK INSPECTION,
994 WASHINGTON STREET, BOSTON, MASS.

To the Board of Health, Boston, Mass.:

GENTLEMEN, — I have the honor to report on the work of the Bureau of Milk Inspection for the year ending January 31, 1900.

The total number of samples examined exceeded that of the year preceding by 2,271. The number of samples of milk was 14,530, divided as follows: From wagons, 8,455; from stores, 5,755; brought in for inspection by citizens, 320. No unusual forms of adulteration were detected, and but thirteen samples out of the entire number examined were found to contain foreign substances, added either to lend color or to delay decomposition. Four were found to contain annatto, one contained caramel, and eight had been treated with formaldehyde. Each of these thirteen specimens was brought to the attention of the Courts, and in each case a conviction was secured.

The Legislature of 1899 amended the statute relating to the standard by adding September to the months during which 12 per cent. of milk solids will suffice instead of 13, so that the higher standard obtains only from October 1 to April 1. A new law was enacted requiring inspectors to send the results of analysis within ten days to the persons from whom milk samples are taken.

The regulation of the Board of Health for the prevention of the sale of milk produced or stored under unsanitary conditions has been productive of much good. Over 3,000 applications were made for permits to sell milk from wagons and in stores, and in each case an inspection was made of the premises of the applicant. Many applications were rejected on account of unsanitary conditions, and several hundred were withheld until certain stipulated changes had been properly carried out.

Samples of butter to the number of 1,663 were examined during the year. But a very few were found to be oleomargarine, and these had not been offered openly for sale. The number of restaurants serving oleomargarine without notice has still further diminished, and at the present time the illegal use of this substance is confined chiefly to the dining-rooms of the smaller boarding-houses, where transient guests are accommodated. No new legislation concerning oleomargarine has been enacted, but a law was passed governing the sale of "process butter," and requiring the proper marking of all renovated butter of whatever description. A very serious obstacle to its proper enforcement, however, is the great difficulty of establishing beyond a legal doubt that a given sample of butter has been subjected to a renovating process.

Attention was called in the early part of the summer to certain brands of Neufchatel and cream cheeses which possessed unusual keeping qualities, and it was found that borax and boracic acid had been employed with a generous hand in their manufacture. A number of samples, 153, were collected and examined, and in each case in which the preservatives were found a letter was addressed to the retailer warning him to discontinue the sale. Within a very short time it was found to be impossible to obtain any more of the chemically preserved cheese.

The number of samples of vinegar taken during the year was 912. The quality in general has continued to be excellent.

SUMMARY OF SAMPLES EXAMINED.

Number of samples of milk from milk wagons . .	8,455
Number from shops, restaurants, and lunch wagons .	5,755
Number brought in by citizens for inspection . .	320
Number of samples of butter and oleomargarine .	1,663
Number of samples of cheese	153
Number of samples of vinegar and cider-vinegar .	912
Total samples	17,258

SUMMARY OF PROSECUTIONS.

Possession or custody with intent to sell, or sale of milk not of good standard quality	172
Possession with intent to sell, or sale of milk not of good standard quality and containing annatto or caramel color	5
Possession of milk containing formaldehyde with intent to sell	8
Carried forward	185

Brought forward	185
Sale of skimmed milk not of standard quality	1
Obstruction of a collector in the performance of duty,	1
Serving oleomargarine without notice	7
Possession with intent to sell, or sale of oleomargarine made in imitation of yellow butter	6
Sale of molasses vinegar as cider vinegar	9
Possession of adulterated cider-vinegar with intent to sell	6
Possession of adulterated vinegar with intent to sell,	6
Total complaints	221

RESULTS OF PROSECUTIONS.

Warrants returned without service	5
Cases *nol pros'd*	6
Defendants left the State pending trial	2
Acquittals	9
Convictions	199
	221
Amount paid in fines	$6,188 00

Respectfully submitted,

CHARLES HARRINGTON,
Inspector.

REPORT OF THE INSPECTOR OF PROVISIONS.

Boston, January 1, 1900.

To the Board of Health:

Gentlemen, — I beg to present herewith the following report of the Inspector of Provisions Department for the year ending December 31, 1899:

Total number of packages seized and condemned . 5,692

Meats.

Beef, tainted	550	pounds.
Livers “	140	“
Poultry “	17,923	“
Veal, immatured	4,506	“

Game.

Grouse	50	pair.
Pigeons	1,800	
Partridges	5	

Fish.

Clams, tainted	1,632	cans.
Haddock “	754	pounds.
Cod “	1,272	“
Whitefish “	5,810	“
Herring “	1,724	“

Vegetables.

Apples	87	bushels.
Asparagus	10	crates.
Beans, 73 crates, 2 barrels	608	baskets.
Bananas	7	bunches.
Cranberries	10	bushels.
Cucumbers, 42 crates, 1 barrel	133	baskets.
Corn, green	3	bushels.
Cabbage, 42 crates	28	barrels.
Egg plant, 13 “	21	“
Grapes	1	bushel.

Limes	18 barrels.
Melons, 581 crates, 1,273 baskets	200 "
Peas	157 baskets.
Plums	5 crates.
Peaches	3 "
Pears	24 barrels.
Peppers	1 barrel.
Potatoes	477 bushels.
Spinach	8 barrels.
Strawberries	596 quarts.
Squash	5 baskets.
Turnips	243 bushels.
Tomatoes, 19 crates	4 barrels.
Watermelons	3,576

REMARKS.

Very satisfactory results have been obtained by the inspection, which has been carried on every Saturday night, in and about the markets during the year. The past year has been the most trying season for poultry that has been known for a number of years. It has required the most constant and rigid inspection of all poultry consigned to Boston market, and, as will be seen by this report, an unusually large amount has had to be seized and condemned as being unfit for food. Pedlers' teams that contain fish, fruits, and vegetables are still being closely inspected as to quality and condition of their goods. Owing to the arrests and convictions made last year it has given the pedlers to understand that the Board of Health intends that they shall comply with the law.

Steamship and railroad lines were not overlooked, but special attention to them the past season has been given, as shipments from the South and West of green vegetables have been unusually large, and has required the greatest care in not permitting decayed fruit or vegetables to leave the railroads or steamship lines until they were properly inspected, that being the time and place in which to prevent unwholesome food getting upon the public markets for consumption. It has called for a very constant and careful amount of inspection.

Respectfully submitted,

JOHN C. GROUSE,

Inspector.

NORTH GROVE STREET MORGUE.

Boston, January 1, 1900.

To the Board of Health:

Gentlemen, — I have the honor to report that for the year ending December 31, 1899, there were received and cared for by me, as Superintendent of City Morgue, *one hundred and eighty-three* bodies of persons deceased, a majority of which were unknown at time of reception; all but ten were subsequently identified.

The Medical Examiner and his associate have made fifty-three autopsies, at which I assisted.

I have the honor to be

Very respectfully,

Fred L. Briggs,

Superintendent, City Morgue.

REPORT OF SUPERINTENDENT OF PEDLERS.

CITY BUILDING, NORTH GROVE STREET,
February 1, 1900.

To the Board of Health:

GENTLEMEN, — I have the honor to submit the following report of the work performed by this branch of the Health Department for the year ending January 31, 1900:

Eighty-one licenses for the collection of bones, grease, etc., were granted. The renewals of same were in February, 78; March, 71; April, 74; May, 70; June, 73; July, 75; August, 70; September, 71; October, 68; November, 65; December, 64; January, 65.

Certificates were issued to pedlers of fruit, provisions, and fish, and numbers assigned (Chap. 43, Sect. 86, Revised Ordinances 1892) in —

February, 400; March, 31; April, 77; May, 67; June, 55; July, 19; August, 34; September, 18; October, 30; November, 11; December, 14; January, 10.

On the first Monday of each month the vehicles and receptacles inspected and numbers approved (Chap. 43, Sect. 86) were, in

March, 354; April, 330; May, 301; June, 325; July, 246; August, 300; September, 285; October, 202; November, 245; December, 251; January, 106.

Complaints were made in court against four persons for violating the ordinances relating to pedlers, and were convicted and paid fines amounting to $25.

The City Collector received from pedlers' licenses $2,849, $2,525 of which was paid for city licenses. This sum is less than the previous year and is caused by the system of supervision of pedlers being demoralized on account of many unlicensed persons doing business in Boston, on permits issued by the Superintendent of Streets.

The licenses granted during the year were:

Licenses to remove bones, grease, etc.	81
Numbers assigned by the Board of Health	766
Licenses granted by the Secretary of State (city)	101
Licenses granted by the Secretary of State (county)	81
Licenses granted by the Secretary of State (taxpayers)	129

Respectfully submitted,

JACOB BARBER,
Acting Superintendent of Pedlers.

APPENDIX.

The following regulations adopted from time to time by the Board of Health are still in force:

REMOVAL OF MANURE.

May 10, 1875.

Ordered, That no manure shall be removed except in a tight, canvas-covered vehicle, with the covering so secured to the sides and ends of the vehicle as to prevent the manure from being dropped or left in any street or way of the city in process of removal, and not loaded in or upon any street, lane, alley, or passageway or upon or across any sidewalk.

REFUSE.

September 8, 1876.

Ordered, That no person removing earth, dirt, sawdust, soot, ashes, shavings, hair, shreds, manure, oysters, clams, or lobsters, waste water, or any animal or vegetable substance, house offal, swill, rubbish, or filth of any kind whatsoever, shall suffer it to leak, escape, or drop from any vehicle by him owned or driven into or upon any street, court, square, lane, alley, wharf, or public enclosure in the city of Boston.

OFFENSIVE TRADES.

August 7, 1878.

Ordered, To forbid, after this date, the exercise of the trade or employment of manufacturing fertilizers or guano from fish or other animal matter within the limits of the city of Boston, except on the islands in the harbor, at the abattoir in the Brighton District, or such other places as may have been or may hereafter be assigned by said Board, such trade or employment being in the opinion of the Board a nuisance, hurtful to the inhabitants, the exercise of which is attended by noisome and injurious odors.

CONTAGIOUS DISEASES.

November 21, 1882.

Whereas, The diseases designated as small-pox, scarlet fever, diphtheria, and typhus fever are contagius and dangerous to the public health, and have been, and may easily be, contracted at funerals from dead bodies or apartments which have been infected by such diseases ; it is, therefore, *Ordered*, That from and after this date no public funerals shall be held over the remains of any person having died of small-pox, scarlet fever, diphtheria, or typhus fever, without the written permit of the Board of Health, and under such regulations as may prevent the spread of either of said diseases.

Ordered, further, that the remains of persons dying of either of said diseases shall at once be placed in a tight or sealed coffin, and shall not thereafter be exposed to view or disturbed except for burial.

CIRCULAR TO UNDERTAKERS.

BOARD OF HEALTH, 12 BEACON STREET,
BOSTON, January 3, 1890.

To Undertakers:

The following Statute Law and the Regulation of the Board of Health is published for the information of Undertakers and others having charge of the burial of bodies:

CHAPTER 124, COMMONWEALTH OF MASSACHUSETTS, IN THE YEAR 1883.

AN ACT RELATING TO THE REMOVAL AND TRANSPORTATION OF CERTAIN BODIES FOR BURIAL.

Be it enacted by the Senate and House of Representatives in General Court assembled, and by the authority of the same, as follows:

SECTION 1. Section Five of Chapter 32 of the Public Statutes, relating to the burial or removal of bodies for burial, is amended by inserting in the eleventh line thereof, after the word "bury" the words "or remove."

SECT. 2. No railroad corporation, or other common carrier or person, shall convey or cause to be conveyed, through or from any city or town in this Commonwealth, the remains of any person who has died of small-pox, scarlet fever, diphtheria, or typhoid fever, until such body has been so encased and prepared as to preclude any danger of communicating the disease to others by its transportation, and no local registrar or clerk shall give a permit for the removal of such body until he has received from the Board of Health of the city, or the Selectmen of the town where the death occurred, a certificate, stating the cause of death, and that said body has been prepared in the manner set forth in this section, which certificate shall be delivered to the agent or person who receives the body.

SECT. 3. This Act shall take effect upon its passage.

REGULATION.

IN BOARD OF HEALTH, BOSTON, January 3, 1890.

In pursuance of the above law the Board of Health makes the following regulation:

Ordered, That the bodies of all persons dying from small-pox, diphtheria, membraneous croup, scarlet fever, or typhus fever must

immediately be prepared for the coffin, wrapped in a sheet saturated in a 10% solution of chloride of zinc and placed in a coffin which must be made absolutely tight, and which must not be reopened.

INSTRUCTIONS. — It will be necessary for Undertakers to first comply with the above Law and Regulation, and then certify the same to this Board. The Board of Health will thereupon issue the required certificate.

Blanks for the Undertakers' use will be furnished at this office.

By order of the Board of Health,

SAMUEL H. DURGIN, M.D.,
Chairman.

COWS.

BOSTON, April 26, 1892.

Whereas, Cows' milk is one of the most common and necessary articles of food, and is oftentimes seriously impaired in usefulness and rendered dangerous to health by the want of proper care in its production or subsequent treatment or handling; it is, therefore, ordered that the following regulation be and is hereby adopted:

SECTION 1. No person shall use any building as a stable for cows unless it contains at least 1,000 cubic feet of space for each animal, is well lighted and ventilated, has tight roof and floors, good drainage, a supply of pure water, and all other necessary means for maintaining the health and good condition of the cows, and has been approved by the Board of Health.

SECT. 2. Every person using any such building shall keep the same and the premises connected therewith, and all land used for pasturage of the cows, clean and free from filth.

SECT. 3. Every person keeping a milch cow shall permit it to be examined from time to time, as to its freedom from disease, by a veterinarian designated by the Board of Health.

SECT. 4. No person having an infectious disease, or having recently been in contact with any such person, shall milk cows or handle cans, measures, or other vessels used for milk intended for sale, or in any way take part or assist in handling milk intended for sale, until all danger of communicating such disease to other persons shall have passed.

SECT. 5. No person shall sell or use for human food the milk of a diseased cow, or permit such milk to be mixed with other milk, nor until it has been boiled, shall sell or use such milk, or any mixture of such milk, for food of swine or other animals.

RECEPTACLES FOR GARBAGE, ETC.

September 6, 1892.

Ordered, That no person, unless authorized so to do, be allowed to handle, disturb, or remove the contents of any receptacle for garbage or rubbish of any kind placed in the yards, passageways, or public streets.

DESTRUCTION OF CLOTHING, ETC.

September 10, 1892.

Ordered, That hereafter no articles of clothing or bedding in use shall be thrown overboard from any vessel in Boston Harbor without the written consent of the Board of Health or the quarantine physician; nor shall any such articles be removed from any vessel at her dock without such permission; such articles shall no longer be brought to the city to be destroyed, but shall be burned in the harbor, under the supervision of the quarantine physician, in the furnaces of the steamers.

OYSTER SHELLS.

October 17, 1892.

Whereas, The storing and handling of oyster shells near business and residential districts are attended by noisome and injurious odors, it is hereby ordered that no oyster shells shall be kept in or removed from any building, yard, or other place within the built-up portions of the city, except by written permission from the Board of Health, and only at such times and in such manner as shall be prescribed in said permit.

QUARANTINE.

March 4, 1893.

At a meeting of the Board of Health, this day, it was ordered that the several quarantine regulations, now in force at this port, be revised so as to read as follows:

Ordered, That any vessel arriving at this port, which has on board at the time of her arrival, or has had during her passage to this port, any sickness of a contagious, infectious, or doubtful character which may be dangerous to the public health, or which has come from or has been in any port or place which has been epidemically infected with any contagious or infectious disease within the six months next preceding such arrival, or has on board any merchandise which has come by transhipment from any such infected port or place within the six months next preceding, or has on board any immigrants (except from British America) shall be anchored at quarantine.

Infected persons found on such vessels shall be removed to the hospital on Gallop's Island, and there detained until all power to infect others shall have ceased. Cargoes and personal baggage, which in the opinion of the Port Physician or the Board of Health may be infected, shall be removed to Gallop's Island and there disinfected, when such disinfection cannot be properly done on board the vessels or on lighters.

All immigrants, on arrival at quarantine, shall be subjected to examination as regards their freedom from contagious or infectious disease and their protection from small-pox.

All persons under ten years of age, who have not been successfully vaccinated, and all persons over ten years of age who have not recently been successfully vaccinated or revaccinated, shall be considered as unprotected from the effect of the contagion of small-pox, persons having had an attack of small-pox excepted.

All persons not so protected shall be vaccinated or subjected to a quarantine of fifteen days' observation.

All old rags, paper stock, hair, feathers, hides, skins, wool, and similar materials which are liable to convey disease germs must be accompanied by satisfactory certificates as to their place of collection and packing for shipment.

No article of clothing or bedding in use shall be thrown overboard from any vessel in Boston Harbor without the written consent of the Board of Health or the Quarantine Physician; nor shall any such article be removed from any vessel at her dock without such permission; all such articles which are to be destroyed shall be burned in the harbor under the supervision of the Quarantine Physician, in the furnaces of the steamers.

No vessel shall leave quarantine, nor shall her cargo, or any part thereof, be discharged, nor any person be allowed to go on board or to leave her while in quarantine, without the written permit of the Port Physician, who is hereby authorized and instructed to take such measures with regard to said vessel, cargo, and persons, as, in his judgment, the public health may require.

It is also hereby ordered, that during June, July, August, September, and October of each year, subject to such changes as circumstances may from time to time require, all vessels arriving in this harbor from the following ports shall stop at the Quarantine Station, viz.: All vessels from any port in Europe, from the Western, Madeira, Canary, or Cape de Verde Islands; from the Mediterranean or Straits thereof, from the west coast of Africa, or around the Cape of Good Hope; from the West India, Bahama, or Bermuda Islands; from any American port south of Virginia, including Central and South America; and vessels arriving from any place in the United States or British America, where they may have touched on their way from any foreign port or place above named.

No such vessel shall leave quarantine or unload her cargo or any part thereof, nor shall any person go on board or leave the vessel while in quarantine without the written permit of the Port Physician, who is hereby authorized and instructed to take any measures in regard to such vessels, as, in his judgment, the public health may require.

The Port Physician is hereby authorized and instructed to demand and receive the quarantine fees which are hereby made and established by this Board, and which are as follows:

For examination of vessels of 500 tons and upwards (registration tonnage), eight dollars.

For examination of vessels under 500 tons (registration tonnage), five dollars.

For disinfecting vessels, from ten to fifty dollars.

For baths and disinfecting personal clothing and baggage, one dollar for each person.

For vaccination, twenty-five cents for each person.

For board of patients in hospital, ten dollars a week.

Such fees to be by the Port Physician paid to the City Treasurer.

REFUSE MATERIALS.

March 30, 1893.

Voted, That, whereas, in the opinion of the Board of Health, the use of refuse materials in filling ponds and bodies of water and wet lands is a nuisance, source of filth, and cause of sickness, it is therefore

Ordered, That no person shall throw into any pond or body of water or upon any land which at any time is covered with tide-water, within the limits of the city, any refuse animal or vegetable matter or any perishable material or rubbish or filth of any kind whatsoever, between the first day of April and the first day of November, except in accordance with a written permit issued from the Board of Health to the owner of such pond or land, and no owner of such pond or land shall refuse or neglect to remove therefrom any refuse or filth hereinbefore described which shall be thrown or placed in or upon the same within the period hereinbefore specified.

FILLING FOR PONDS AND WET LANDS.

April 10, 1893.

Whereas, In the opinion of the Board of Health, the use of refuse materials in filling ponds and bodies of water and wet lands is a nuisance, source of filth, and cause of sickness, it is therefore ordered that no person shall throw into any pond or body of water, or upon any land which at any time is covered with tide-water, within the limits of the city, any refuse animal or vegetable matter or any perishable material or rubbish or filth of any kind whatsoever, between the first day of April and the first day of November, except in accordance with a written permit issued from the Board of Health to the owner of such pond or land, and no owner of such pond or land shall refuse or neglect to remove therefrom any refuse or filth hereinbefore described which shall be thrown or placed in or upon the same within the period hereinbefore specified.

TEXAN CATTLE.

July 29, 1893.

Whereas, Northern and Western cattle exposed to those coming from Texas, or to the premises which have been used by Texan cattle, are likely to contract a disease known as Texas fever among cattle, it is therefore ordered that none of the cattle arriving from Texas shall be driven over any road or across any lands which are used or liable to be used by other cattle, nor in any way exposed to such other cattle within the limits of Boston, except within the yards immediately connected with the abattoir.

STORAGE OF FRUIT.

August 3, 1893.

No person shall store or keep or allow to be stored or kept in any building of which he is the owner or occupant, and which is in use in whole or in part as a dwelling-house, any fruit or merchandise, except in accordance with a written permit from the Board of Health.

KILLING OF POULTRY.

July 16, 1896.

"That no live chickens, geese, ducks, or other fowls, shall be brought into, or kept, or held, or offered for sale, or killed or plucked, in any place in the city of Boston, without a permit therefor in writing from the Board of Health, which shall be subject to revocation by said Board at any time."

SPITTING IN STREET CARS AND UPON SIDEWALKS.

At a meeting of the Board of Health, March 23, 1899, the regulation dated October 13, 1896, respecting spitting in street cars, was amended so as to read as follows:

"The Board of Health hereby adjudges that the deposit of sputum in public places is a nuisance, source of filth, and cause of sickness, and hereby orders: That spitting upon the floor, platform, or steps of any railroad, or railway station, car, public building, hall, church, theatre, market, or any sidewalk immediately connected with said public places, be, and hereby is, prohibited."

OFFENSIVE TRADES.

October 13, 1896.

The Board of Health hereby forbids the exercise of the trades or employments of slaughtering animals, rendering animal-matter (except fresh tallow), manufacturing fertilizers, mixing or storing refuse, animal or vegetable substances, smoking fish or meat, refining oils, making varnish, asphaltum, glue, gas, gasoline, or any burning fluid within the limits of the city of Boston, except at such place or places as may be assigned by said Board; such trades or employments being nuisances, hurtful to the inhabitants of said city, dangerous to the public health, attended by noisome and injurious odors, and otherwise injurious to the estates of said inhabitants.

PEDLERS.

The following laws have been passed for the government of pedlers:

No person shall sell any articles to any person on a public street or go from house to house selling articles, or cry his goods in the street and ways, unless he is a minor, licensed by the Clerk of Committees to sell articles, or he has received a permit from the Superintendent of Streets to sell articles on a public street, recorded his name and place of residence with the Board of Health, and receive from said Board a record number.

No such permit or number shall be given to or used by any person unless the person sells only the following articles, produced or grown in the United States, viz.: Brooms, live animals, fruits, provisions, agricultural products or implements, hand tools used in making boots and shoes, fuel, newspaper, books, pamphlets, or the products of his own labor or the labor of his family other than jewelry, wines, spirituous liquors, indigo, playing cards, or feathers; or the person has received a license as Hawker and Pedler from the Secretary of the Commonwealth *and* — is an honorably discharged soldier or sailor of the late war, *or* — is over seventy years of age, *or* — has paid the City Treasurer twenty-five dollars, *or* — is qualified to vote and has paid a tax on his stock in trade in Boston, *or* — is licensed by said Secretary as a Hawker and Pedler throughout the Commonwealth or throughout the County of Suffolk.

No person selling articles shall refuse or neglect to exhibit his permit, license, and certificate whenever the same is demanded by any public officer.

No person shall sell spirituous liquors, wines, jewelry, feathers, playing cards, or indigo.

No person shall have in his possession, with intent to sell, fish of any kind, unless they are kept in covered stalls or fish-boxes, or in covered carts, well secured from the rays of the sun, nor any fish other than flounders, smelts, or other small fish, salmon or shad, unless they have been cleansed of their entrails and other refuse parts.

No person selling articles shall carry them in any vehicle or receptacle, unless the same is neat, clean, and free from leaks, and has printed upon it his name, the number of his license, and the number given him by the Board of Health, in letters and figures at least two inches in height.

No person selling articles shall carry them in any manner that will injure or annoy the public health or comfort.

No person selling articles shall cry his wares to the disturbance of the peace and comfort of the inhabitants.

No person shall place or permit to remain in any street for more than ten minutes any of his goods or articles without a permit from the Superintendent of Streets.

No person shall, on foot in any street, carry or display any show-card, placard, or sign without a permit from the Superintendent of Streets.

No person selling articles shall stop or stand with a cart, wagon, or other vehicle for the purpose of hawking, pedling, or selling goods, wares, merchandise, fruit, or other articles, between the hours of eight o'clock A.M. and half-past six o'clock P.M., in or occupy any part of the following streets, ways, or squares; namely, Haymarket square, Sudbury street, Court street from Sudbury street to Scollay square, Scollay square, Tremont street from Scollay square to Eliot street, Eliot street from Tremont street to Washington street, Washington street from Eliot street to Franklin street, Franklin street from Washington street to Devonshire street, Devonshire street from Franklin street to Milk street, Milk street from Devonshire street to Pearl street, Post Office square, Water street to Washington street, State street between Merchants row and Devonshire street, and Washington street from Adams square to Haymarket square, or any of the streets, ways, or squares included within the territory bounded as above described, or except in accordance with an order of the Board of Aldermen, stop or stand in, or occupy any part of the streets, ways, and squares in the city proper, north of Massachusetts avenue, with a hand-cart or wheelbarrow for the purpose of hawking, pedling, or selling any goods, wares, or merchandise, fruit, or other articles, between the hours of eight o'clock A.M. and half-past six P.M.

No person shall sell or expose for sale by public auction any articles except in such place as is expressly described or set forth in his license or permit.

[Public Statutes, ch. 68; 1883, ch. 118 and 168; 1885, ch. 305 and 309; 1887, ch. 422 and 445; 1889, ch. 331 and 457; 1890, ch. 448 and 449; 1891, ch. 144; 1894, ch. 525; Rev. Ord., 1892, ch. 43; Rev. Reg., 1892, ch. 6.]

CONTAGIOUS DISEASES.

March 10, 1897.

At a meeting of the Board of Health, this day, it was voted to amend the regulation of July 1, 1895, respecting contagious diseases, so to read as follows:

1. Whoever is infected with small-pox, scarlet fever, diphtheria, or membraneous croup, shall immediately proceed to some isolated place or room designated by the Board of Health, and no person who has been so affected shall leave such place or room, and no article shall be removed from such place or room until the Board of Health shall certify in writing that all danger of communicating such disease to others is passed.

2. Every parent or guardian of any child or ward infected with small-pox, scarlet fever, diphtheria or membraneous croup, shall immediately cause such child or ward to be conveyed to some isolated place or room approved by the Board of Health, and no parent or guardian shall permit such child or ward to remove from such place or room until the Board of Health shall find and certify in writing that all danger of communicating such disease to others has passed.

3. No person other than the attending physician, nurse, and agents of the Board of Health shall enter, *nor shall any dog, cat, or other animal be allowed to enter* any apartment or other place set apart for the treatment of small-pox, scarlet fever, diphtheria, or membranous croup until the Board of

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NOTE.—The amendment is shown by words in italics.

Health shall certify in writing that such apartment or place has been satisfactorily disinfected.

4. No person having the care of any other person who has been affected with small-pox, scarlet fever, diphtheria, or membraneous croup, shall advise or permit such other person to leave any place designated by the Board of Health as a place of isolation of such infected person before said Board of Health shall have certified in writing that such person can leave such designated place without danger to others.

5. No physician who has been in attendance upon any person who has been infected with small-pox, scarlet fever, diptheria, or membraneous croup, shall advise or knowingly permit such person to leave any place designated by the Board of Health as a place of isolation of such infected person before said Board of Health shall have certified in writing that such infected person can leave such place without danger to others.

WALL DRAPERIES.

October 11, 1898.

"The Board of Health adjudges that the use of 'Wall Draperies' at funerals is a source of filth and cause of sickness, and hereby orders: That the use of such draperies in any room or place used for a funeral or for the preparation or retention of any human body before or in connection with such funeral, be and hereby is, forbidden."

MILK.

December 22, 1889.

Whereas, In the opinion of the Board of Health infectious diseases are spread by the distribution of milk produced, stored, and distributed under improper conditions; it is, therefore,

Ordered, That the following regulations be and hereby are adopted:

ARTICLE I.

SECTION 1. All persons in the city of Boston engaged in the production of milk for sale, or in the business of selling, delivering, or distributing milk in said city, shall annually on the first day of May, or within thirty days thereafter, make written application to the Inspector of Milk, on forms prescribed by the Board of Health, for a license.

SECT. 2. No person in said city shall engage in the business of producing milk for sale, or in the sale or distribution of milk in the city of Boston, without a license so to do, under these regulations and such other conditions as the Board of Health may impose; said license to be revoked if the licensee fail to comply with the conditions of his license or the regulations of this Board.

SECT. 3. The conditions under which every cow is kept whose milk is brought into the city of Boston, or kept, delivered, distributed, sold, or offered for sale in said city, shall be made known by the license to the Inspector of Milk in such detail as the Board of Health may require, and shall be approved by said Board; and no milk except that derived from such cow shall be brought, kept, delivered, distributed, sold, or offered for sale in said city.

SECT. 4. No milk shall be sold, offered for sale, or distributed in the city of Boston unless the cows from which it is derived have, within one year, been examined by a competent authority, and shown to be free from diseases dangerous to the public health; but this shall not be construed as forbidding the sale or use of milk from cows not tested with tuberculin.

SECT. 5. All persons having a permit or license to sell, deliver, or distribute milk in the city of Boston, shall keep a copy of the license constantly posted in a conspicuous place on the premises, and shall have his name and the number of his license marked in plain uncondensed Gothic letters, not less than one inch in height, on vehicles used by him in the conveyance and sale of milk.

ARTICLE II.

SECTION 1. No milk for sale or distribution shall be stored in that portion of a building which is used for the stabling of horses, cows, or other animals, or for the storing of manure, or in any room used in whole or in part for domestic or sleeping purposes.

SECT. 2. No person in the city of Boston engaged in the business of producing milk for sale, and no person engaged in the business of storing or delivering milk in said city, shall store, cool, or mix said milk in any room which is occupied by horses, cows, or other animals. All rooms in which milk is stored, cooled, or mixed, shall be provided with tight walls and floor and kept constantly clean. The walls and floors of said rooms to be of such a construction as to allow easy and thorough cleansing. The room or rooms aforesaid shall contain proper appliances for washing or sterilizing all utensils actually employed in the storage, sale, or distribution of milk, and all such apparatus and utensils shall be washed with boiling water or sterilized by steam regularly after being so used.

SECT. 3. No urinal, water-closet, or privy shall be located in the rooms called for in the preceding section, or so situated as to pollute the atmosphere of said rooms.

SECT. 4. All milk produced in the city of Boston for sale shall be strained, cooled or stored as soon as it is drawn from the cow.

ARTICLE III.

SECTION 1. Milk kept for sale in any store, shop, restaurant, market, bakery, or other establishment, shall always be kept in a covered cooler, box, or refrigerator, properly drained and cared for, and while therein shall be kept tightly closed and only in such locations and under such conditions as shall be approved by the Board of Health.

ARTICLE IV.

SECTION 1. All cans, bottles, or other vessels of any sort, used in the retail sale, delivery or distribution of milk to the consumer, must be cleaned or sterilized before they are again used for the same purpose, and it shall be deemed a sufficient reason for forfeiture of license for any milk dealer to fail so to do.

SECT. 2. No person shall use in any way a milk vessel for any other substance than milk, and any licensed milk dealer who shall so misuse such vessel shall be liable to forfeiture of license.

ARTICLE V.

SECTION 1. Every person engaged in the production, storage, transportation, sale, delivery, or distribution of milk shall immediately on the occurrence of any case or cases of infectious disease either in himself or in his family, or amongst his employees or within the building or premises where milk is stored, sold or distributed, notify the Board of Health, and at the same time shall suspend the sale and distribution of milk until authorized to resume the same by the Board of Health. No vessels which have been handled by persons suffering from such diseases shall be used to hold or convey milk until they have been thoroughly sterilized.

RAGS.

February 28, 1899.

The following is an amendment to the regulation on the same subject passed January 12, 1885:

Whereas, It is a practice in this city to collect rags, old paper, and other refuse material, from dumping-grounds,